



SATURDAY, MAY 4, 1872.

## The Moore Steel Elastic Car-Wheel.

The wear to which car-wheels are exposed, and the strength required to resist the strains and shocks to which they are subjected, has quite naturally called forth a great deal of ingenuity to produce a wheel capable of resisting the destructive influences to which they are exposed. Our engraving represents the latest and most improved form of the Moore elastic wheel, which has now been in use for a number of years.

Its construction is very clearly represented by the engraving. The center of the wheel is made of cast-iron, with hollow spokes and rim. The tire is steel, with an elastic wooden seat between it and the center. This seat is formed of pieces of wood fitted into a dove-tailed groove turned in the outer rim of the wheel. The beveled edges of this groove are cut away at one point just wide enough to admit one of the wooden pieces. They are all "entered" at this point and slid around until the whole rim is covered. The tire is then secured by the rivets shown in the section which are riveted up so as not to be in danger of becoming loosened. Formerly the tires were fastened by screw bolts, but it was found that the nuts were liable to be loosened by the jar to which they were subject.

These wheels have been introduced on a number of roads; and on the Erie are used for the leading truck wheels of Mogul engines, the flanges of which are exposed to great lateral strains. That a steel flange has more strength than a cast iron one needs no demonstration; and, therefore, this form of wheel is coming into use for cars and locomotives and for such service as requires great strength and where wheels are subjected to great lateral strains. The wooden seat reduces the wear in the tread of the wheels and by deadening the noise also lessens the wear of the nerves of passengers. For this reason they are very well adapted for sleeping or other passenger cars whose occupants are at all nervous.

These wheels are made by The Moore Elastic Car-Wheel Company of Jersey City, who will, no doubt, be glad to give any further information concerning them.

## Conductors' Trips.

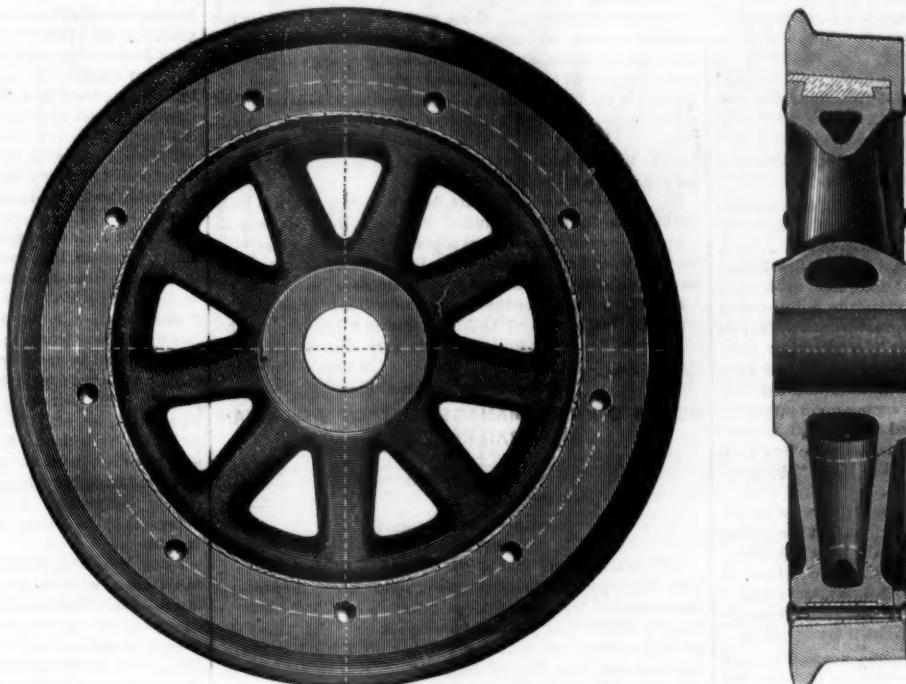
A correspondent of the Chicago Tribune, who subscribes himself "Ex-conductor" says:

I have noticed with regret the occasional necessity of the employment of detectives upon railroad trains to test the integrity of conductors and ticket-agents, and to protect the company from loss by peculations of bad and dishonest men. Under the present system, however, there appears no other way than the one adopted to detect and punish the perpetrators of fraudulent practice. The long trips and "lay-off days" assigned to conductors by railroad companies are sometimes unfortunate to both parties, as we may rest assured that, when man has nothing to do the Devil is fishing for his soul. I say, let the conductors perform a specified trip each and every week-day of the year, and their duty will be better performed, and the company have less cause for detectives.

The assignment of "round trips"—i. e., an odd number of conductors for an even number of trips—seems to give the largest experience on the line for safety of trains and acquaintance with local passengers. Many a young man has taken his first step leading to dishonesty while having nothing else to do. The "double duty" and "lay-off days" are not economical for the corporation, as no man can discharge his duty efficiently beyond the first half of his long trip. After that, he becomes more or less exhausted, both in body and mind, with diminishing energy to the end of his division of the line. And, in making his last settlement with his passengers before reaching the end of his route, he may often find passengers who came on board of his train at way-stations, that had not been called upon at the proper time for their tickets, and it would not be unfair for him to estimate that about as many had left the train without paying fare as he finds unsettled with at the close of the trip. Every conductor must admit that, the more frequently the passengers are required to "show their tickets," the more likely he will be to receive the largest amount of money from way-passengers, who may, if not called upon, fail in their efforts to "find the conductor," to pay their fares before the train stops at the station where they are obliged to leave it. Therefore, the more frequently the conductors are changed, making short trips, on a long line, the better it appears to be for the company.

Mr. Fred. H. Smith, Associate Engineer and General Superintendent of the Baltimore Bridge Company, takes a vacation for a year on account of failing health and goes to Augusta, Ga.

Col. James H. Howe, General Manager of the Chicago & Northwestern Railway, was seriously injured on the 21st ult., by being thrown from his carriage at his home in Kenosha, Wis.



## Contributions.

## THE RAILROAD SYSTEM OF CALIFORNIA.

## NO. I.—SOME HISTORY.

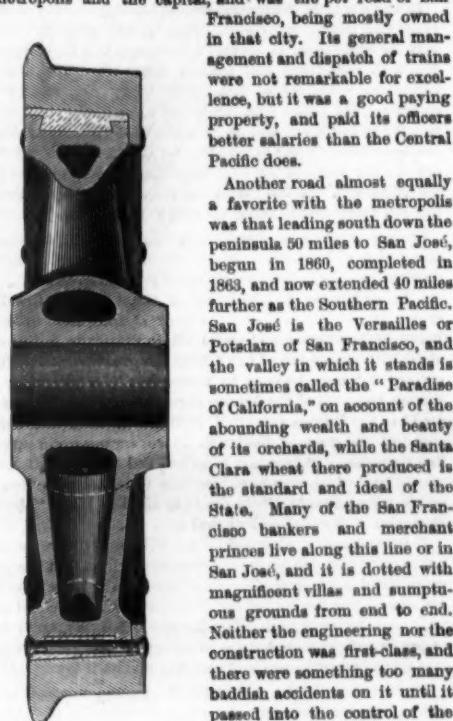
SAN FRANCISCO, April 3, 1872.

The star of California revolves around in an orbit so vast and so remote from the common center that the eyes of Eastern people are seldom directed hither. Californians going East complain that our affairs are very little understood among our "brothers by the further sea," and that there obtains an inadequate notion of the State's progress; and probably the item of railroad development forms no exception. In offering a few notes on the railroad system of California, I cannot hope to present your readers any technical disquisitions, but only some account of the growth of the system, its relation to the people, and its connection with the general prosperity, viewed from the standpoint of an outsider deeply interested in all that concerns the common weal of California.

From 1849 to 1856 there was no railroad in the State or on the

dimensions nearly every mile on scores of the trunk roads leading up through the foothills. These two classes constituted a powerful phalanx, united to a man against the railroad. Hence the reader will not be so much astonished in considering that the railroad first above-mentioned, one of capital importance, was eight years in pushing 22 miles further east into the mines.

The most important line of communication in the State always has been and always will be that between San Francisco and Sacramento. But the steam service on the river early gained a strong foothold, and the frequency and the rapidity of the trips caused the lack of a railroad to be less noticed. True, there never was really more than one steamboat line, that of the California Steam Navigation Company, but there was seldom an opposition lacking, for one or two boats would run a month or so with genuine Californian recklessness, then be bought off or ascend the flume, and another company would take their place. The first railroad between these points was the California Pacific (I do not recall the date), running on the north bank of the Sacramento, 60 miles by rail from Sacramento to Vallejo, and 23 miles by steamer to San Francisco. This still is, though now absorbed by the Central Pacific, the quickest route between the metropolis and the capital, and was the pet road of San Francisco, being mostly owned in that city. Its general management and dispatch of trains were not remarkable for excellence, but it was a good paying property, and paid its officers better salaries than the Central Pacific does.



Another road almost equally a favorite with the metropolis was that leading south down the peninsula 50 miles to San José, begun in 1860, completed in 1863, and now extended 40 miles further as the Southern Pacific. San José is the Versailles or Potzdam of San Francisco, and the valley in which it stands is sometimes called the "Paradise of California," on account of the abounding wealth and beauty of its orchards, while the Santa Clara wheat there produced is the standard and ideal of the State. Many of the San Francisco bankers and merchant princes live along this line or in San José, and it is dotted with magnificent villas and sumptuous grounds from end to end. Neither the engineering nor the construction was first-class, and there were something too many baddish accidents on it until it passed into the control of the Central Pacific. At the upper end it runs into the backbone

of the peninsula, where a considerable stiff grading is required, whereas it is thought it should have hugged the bay shore all along. Nevertheless, it was always much potted by San Franciscans, who bore with such patience as they might its extortionate charges for commutation. It was the only railroad actually entering the Golden City, and when it was swallowed up, like everything else, by the great Central Pacific, the citizens almost felt as if they had therein a personal grievance.

Homesick California had talked anxiously many years about an overland railroad, as affording a means of more speedy communication with "the old folks at home," but it was not until 1861 that the first measures were taken by ex-Governor Leland Stanford and others which ultimately in the accomplishment of the gigantic undertaking. The attitude toward that road occupied by San Francisco for years was nowise creditable to its foresight and magnanimity, and now it would fain have it forgotten. In the first place, it was chiefly owned and controlled by Sacramento capitalists, and there has long existed just a little jealousy between the two chief cities of the State, dating back as far as the time of the selection of the State capital. In the second place, for some reason which it would require a curious analysis of human character to reveal, San Francisco has always been something more conservative and sceptical in far-reaching business enterprises than many other portions of the State. Hence, while one of the two great metropolitan journals was rather non-committal than otherwise, the other openly flouted the enterprise from the beginning. For years, while the company were grappling with the mighty work of scaling the Sierra Nevada, this doubting Thomas of the Bay capitalists sneered at it as the "Dutch Flat Swindle." But at the last the proprietor of that journal made a manly acknowledgment of his error by taking a conspicuous part in the exercises attending the driving of the golden spike at Promontory.

Stanford was the leading spirit in the enterprise; possessed of a clear intellect and remarkable executive abilities, he captained the small party of venturesome spirits. Hopkins, careful, painstaking and correct, imbued with the strictest principles of honor and probity, looked after the finances; Crocker, industrious, active, thoroughly energetic, and fully comprehending the situation, was placed in command of the practical work; and Huntington, whose honesty was proverbial, and whose word passed as current as an obligation of the country, went East to interest the moneyed men of the nation."

It sounds like an Arabian tale that this now potent company, with their 200 locomotives and \$100,000,000 of property, were two years in building 18 miles of almost level track and three locomotives. Two years in doing what at the last they did in two days! Such was the extent of their progress in 1865, when they saw perhaps their darkest days. But the State came to the rescue and guaranteed the interest of \$1,500,000 of their bonds, at seven per cent, for 20 years; San Francisco gave

them a clear gift of \$400,000; and the counties of Sacramento and Placer subscribed \$550,000 more, which formed a basis of funds and of popular confidence that enabled them to negotiate sufficient loans in New York and weather the storm. This road was not required by Congress to be completed until 1876, I believe, and the company could have made themselves at least \$10,000,000 richer by waiting for the end of the war before commencing, as they were then compelled to sell their government bonds for 40 cents on the dollar; but they patriotically commenced at once.

Sixteen thousand men were employed at the last, of whom one-half were white men, and who gave employment to a great company of grocers, millers, butchers, etc. Three thousand horses were purchased which consumed 84,000 lbs. of barley and oats per week. This army was followed by 7,400 carts and vehicles, all of which were manufactured in California. Fifty vessels a month sailed up the Sacramento laden with materials for the mighty work. Halcyon days were those for California, almost a revival of the ever-lamented "flush times" of 1850, for out of the coffers of the Central Pacific flowed a golden stream of a million dollars a month.

It was not until the enterprise had been on the way about four years that the company were driven at last, after advertising in vain for white men, to employ Chinamen; and they resorted to this with reluctance and against bitter opposition. With the boundless resources of men liberated by Appomattox at its command, the Union Pacific was like to push the point of junction far to the West, and so give the Utah, Idaho and Montana trade to Chicago; and to save this for California, and give themselves a fair share of the line, the company were obliged to take the Chinamen. As the Union had Europe at its back, the Central was compelled to bring up Asia to the charge.

Eastern readers can hardly understand the immense enthusiasm with which California celebrated the completion of the overland railroad. Let them picture to themselves, if they can, the lonesomeness and isolation of twenty years, the dismal, dreary bi-monthly periods from one "steamer day" to another. Think of Americans, and above all Californians, going a sennight without a scrap of news from the great world! Why, so hungry did men become in those days that when, by some chance, the news of the famous cavalry charge of the "six hundred" in the Crimea straggled through Mexico, and got here ahead of the steamer, forthwith there sprang up in merciful San Francisco a corporation to be entitled "The Great Mexican Short-Cut," which was to reduce the time between New York and San Francisco to fifteen days via Mexico. But "the gray-eyed man of destiny" added that egg.

A day had been designated for the celebration here, but at the last it was given out by the railroad authorities that the golden spike could not be actually driven until two or three days later; yet so vast was the bottled-up enthusiasm that it could not be repressed, but shot itself off on the appointed day, amid such a pageantry of processions and booming of cannon as even extravagant and reckless California has seldom if ever equalled.

What followed the completion? In the words of a lively writer, "The golden spike driven on the 10th day of May, 1869, was the coffin-nail driven into many enterprises and branches of business on this coast." Such was the extreme of despondency which many people fell into, after the extreme of sanguine expectation. It had been confidently expected by many, even of the coolest heads, that the railroad would, in some mysterious manner, revive the ever-lamented "flush times" of 1850. The most modest calculations were, that it would bring hither a great tide of immigrants, fill up the State as rapidly as Kansas had been filled up, and create at once an immense Pacific commerce, calling into being steamship lines to India, all the great South Sea domain, South America, etc. But, for some inscrutable reason, to the bitter chagrin of over-sanguine California, the great world wagged on very much as if no overland railroad were in existence. It was two years before England even gave it half of her Colonial mails. Not a single steamer was put on the Pacific as an immediate or approximate result of the completion. A few more immigrants may have arrived, but they were more than counterbalanced by the homesick Californians going East on their first visit to "the old home." The Government land, which had been "corralled" by greedy speculators in sections and whole townships, in anticipation of the in-rushing thousands of immigrants, lay waste and desolate, and the coyote dug his hole therein unscared. Men who had borrowed tens of thousands at extortionate interest, to purchase land or build houses, found themselves cast high and dry on the sand. Perhaps never was there so great a depression in the building trade as in 1871. Says the *Bulletin*:

"It was expected that on the completion of the trans-continental railroad a vigorous stream of immigration would flow into this city from the East, that a great trade with India, China and the East would immediately spring up, and that in consequence there would be an enormous demand for private dwellings, tenement houses, and places of business. These expectations having been only in part realized, the consequence has been that more houses have been built than were needed. Of course, while old houses were not much in demand, the building of new ones was not to be thought of."

In short, there was a universal collapse of business, and, for the nonce, the whole bottom of California dropped out. It was as if two large reservoirs, with the water in one ten feet higher than in the other, should suddenly be united by a canal. All the water would rush across. So Eastern competition of all kinds rushed across, and swamped the business of California.

I have thus elaborately detailed the effects of the trans-continental railroad, for it is a singular instance, if not the only one in history, where a great railroad has damaged almost every interest in a whole country, though, of course, not permanently. The water-level between California and the East had to be restored sooner or later; the railroad did it a little suddenly, that's all. But it was very amusing to hear the jeremiads of the disappointed Californians for two or three years, and even yet, and the ceaseless regrets and sighings for "the days of '49."

The period of history which I assigned as the opening of this

paper extended down to the completion of the Central Pacific. There were a few other lines completed before that date, which demand brief mention.

In 1862 was projected the Western Pacific, from San José to Sacramento, via Stockton; but the owners failed to complete over 20 miles of it, and it suffered the common fate—*omnes eodem cogimur*—passed into the hands of the Central Pacific. That company pushed it through, and by making a branch from Oakland down along the bay, then across via Stockton, established the second rail line between San Francisco and Sacramento, and the only extension they had of their transcontinental road to tide-water. But it is 55 miles longer than the California Pacific, and so, to the chagrin of the great company, they lost not a few of their overland passengers at Sacramento, who, being weary, would seek the quickest transit to the bay.

Other less important lines are as follows: A 26-mile line from Los Angeles to the seaport, Wilmington. This seaport is the starting-point for merchandise destined to the important mining region on Owen's River, between the double crests of the Sierra Nevada. Los Angeles took \$200,000 stock in this road, but the management has become corrupt, and the city is reported anxious to sell.

Another one, 36 miles long, leads from Vallejo to Calistoga, the Californian Saratoga. Hence its principal business is in the summer, when a San Francisco merchant can dispatch the bulk of his day's business, and still run up to the springs in time for a late dinner with his wife and daughters.

There is a road from Marysville to Oroville, 30 miles, another outlet for the mines to navigable waters. It is an unimportant road.

From Mount Diablo there is a five-mile road, leading out from the Pittsburg coal-mine to Suisun Bay.

There are two roads across the bay from this city, one leading out from Oakland five miles, the other from Alameda 16 miles. They run trains several times a day in connection with ferry-boats, and are patronized by hundreds of people living in those delicious suburbs and doing business in the metropolis.

These are all the lines that require mention in what may be called the Dual Period of California railroad history. Of the Monocromatic Period—I will so call it *pace tua*—something in another paper.

STEPHEN POWERS.

#### NOTES ON THE MANAGEMENT OF AMERICAN RAILROADS.

BY A HINDOO.

[CONTINUED FROM PAGE 171.]

##### ADVERTISING.

Our parents tell us that in the halcyon days of their youth lying was considered one of the disreputable vices; they mourn that the lot of their children has fallen in such evil times as these, in which lying has become respectable. As yet we are not quite beyond the influence of those good old days, therefore it is that lying is still supposed to be a moral evil, although a commercial necessity. Railroad companies have not allowed themselves to be outdone in the matter of lying. Whether we take the "correct card" which shows the line straight as the arrow's flight from large city to large city, fearlessly bridging all streams with printers' ink, and making it as plain as the nose on your face that all competing roads are insignificant little lines, crooked as ram's horns, winding as the mazes of a labyrinth; or whether we take the advertisements shining forth in letters of gold and other brazen hues, proclaiming in still more brazen tones, "100 miles distance, \$10 fare and eight hours' time saved by taking the grand route," we find an element of lying and deceit. In almost every station we find the waiting-room walls covered with these advertisements, some of them in costly frames and protected by glass. An immense sum must be expended annually in keeping up these advertisements. With what object? To increase the passenger traffic; to bring before the traveling public the names of roads that might otherwise be passed by unnoticed. Is there sufficient traffic attracted by these advertisements to pay their cost? I think not, and am not alone in that opinion. The general passenger agents, who spend such moments of joy and while away hours of idleness in getting up these precious productions, flatten themselves, no doubt, that their incubations have hatched a fowl that can be plucked. Some great competing roads might, perhaps, benefit by advertising their routes, but even this is doubtful. What are their advertisements intended to do? To attract traffic. Traffic cannot be attracted unless there be some substantial advantage which will attract, such as shortness of route, speed, safety, accommodations at stations, moderation of fare, luxurious appointments, convenience of time and connections, etc. These are matters of which the traveling public desire knowledge. Do the advertisements give it? Not by any means. Many roads with regard to these matters are not able to give satisfactory, if truthful, accounts; yet according to the present fashion they must advertise. Imagined necessity compels them to concoct soft nothings, meaningless phrases, slang terms, or bold, unblushing lies. The favorite advertisement is a combination one. The traveling public may be divided for our present purpose into three classes. 1. Those who know what they are about. 2. Those who do not understand how to seek the truth for themselves, and so take advice of their friends. 3. Those who are ignorant of the art of travel, and have no friends from whom they can seek trustworthy information. The man of the first class keeps in his satchel the latest official guide; he has personal knowledge of many routes; he is constantly meeting with friends who have traveled over many lands and lines; he knows a thing or two; you don't catch a weasel asleep; he probably has never read one of the advertisements through; he understands that part of the business thoroughly. The man of the second class buys a hand-book, and after much consultation, many doubts and anxieties, at last decides upon a route and sticks to it; no advertisement will

turn him aside from the path he has chosen. He possibly believes that all the railroad companies have conspired to cheat him, to damage and pilfer his baggage, to give him only half the room he pays for, to start every connecting train before he can get aboard of it, never to stay at any place where he can get a meal, and, failing all other means of injury, to kill him outright. The man of the third class falls an easy prey to any scalper; he stumbles along, buys his ticket at the first office that runs up against him, takes the first train that may be going in the same direction as himself, nothing heeding express or accommodation; he grumbles little at delay or inconvenience; he is meek and lowly; he probably cannot read the advertisements; if he does his mouth is open wide and awe impresses his soul; but he never looks to the advertisements as a guide. The third class is not a numerous one; lone women and poor emigrants fill the ranks; they fall an easy prey to runners. Of what avail then are advertisements? To be of any use they should show the principal towns on the route, the length of line, rate of fare and a condensed time schedule which should also show time of starting on connecting roads. Attractions of scenery should be brought before the public in the literature of the day in a descriptive, readable style, not as advertisements. That extensive advertising is a *sine qua non* has come to be a commercial maxim and a true one generally, but at any rate railroad companies need not adopt it. They have nothing that they can adulterate, no spot or stain that they can hide, no goods that they can make more tempting by wrapping them up in the soft tones of a silver tongue. What they have to sell lies bare and naked, and will fetch no more than it is worth.

The advertisements, though useless and extravagant, perhaps do no positive injury; but this cannot be said of that system, adopted by many roads, of sending out scalpers and runners to entrap the unwary. These irresponsible creatures, caring nothing for their own reputations, less if possible for the road employing them, here to-day, gone to-morrow, telling the most unblushing falsehoods, heartlessly deceive all whom they can. In Kansas City, Mo., some time ago, at one of the stations I saw a poor woman with three children, complaining bitterly; she had come a long journey; the man from whom she had bought her ticket had assured her solemnly that she would not have to change cars even once from the beginning to the end of her journey. She, poor thing, had when I saw her changed cars three times, been detained over night at one place, and had to cross an unbridged river, and would have to change once more before reaching the end of her weary travel. This was a bad case, yet only a sample of what may be met in those regions pretty often. A system admitting of such practices is a disgrace to the managements permitting it, and is of no real benefit.

Lying, no doubt, sounds a harsh word. The authors of these meretricious advertisements may feel insulted and "scorn the insinuation." Let me say, then, I attribute no habits of mendacity in aught relating to them personally. This commercial lying is so well understood, say they, that no harm is done. Well, if it is so well understood that nobody is deceived, of what use are the advertisements? Why lie just for the fun of the thing? But it is evident that if they do deceive any, it must be just that class of mankind whom it is the greatest cruelty to deceive—the poor, the ignorant, the friendless.

Advertisements are, of course, to a certain extent necessary, but they should be placed judiciously and be made up sensibly. If time can be spared, a hasty perusal of Lindley Murray might give some new ideas on the subject. The indiscriminate plastering of walls with hideous posters, awkward attempts at slang witticisms, and such tricks, might as well be discarded.

[TO BE CONTINUED.]

#### Railroad Literature.

To THE EDITOR OF THE RAILROAD GAZETTE:

I think it would add very much to the pleasure and enjoyment of "Riding in a Pullman Car" if something was done to improve the character of the reading matter in the shape of books and papers sold on our trains. Returning from the West by one of the leading through routes a few weeks ago, I had occasion to spend Sunday on the train, and, having exhausted my own stock of reading matter and other resources for passing away the time, I applied to the train newsboy with a view to obtain something for Sunday reading. The following is a selection from the list of works he presented for me to choose from: "Julia Clark, or the Life of a Bad Woman," "The Trunk Mystery," "Sylvie, the Courtesan's Daughter," "Aldace, or Betrayed to Shame," and a lot more of the same style. No doubt many of your readers have, time and again, had some or all of these *genus* offered to them. For the information of those who have not, I might say that they are all of a class which are described on the cover as "thrilling," "interesting," etc. They are full of assignations, murders, seductions, etc., and are, it is needless to say, of a tendency that is immoral and degrading in the extreme, and quite unfit to be brought into any decent and respectable family circle.

I do not know what supervision, if any, the railroad companies exercise over the stock of the news-vendors on trains, but it is certainly the duty of every company to see that their passengers are not subjected to the annoyance of having such disgusting literature as that I have mentioned thrust upon them, and if it is not practicable to do so generally, surely it can be done on Sundays.

AGENT.  
[Our correspondent should report such a case as this to the General Superintendent of the railroad on which it occurred. Railroad officers cannot be expected to watch over the morals of the passengers they carry, but they are bound to take care that their cars are not turned into shops for the sale of vile literature. There are plenty of creatures, on cars as elsewhere, who will buy such filth, and the average newsboy will sell what there is a

demand for and what he can make a profit on. But it is culpable negligence for managers to permit this; and though very probably they don't know what is sold in their cars, they ought to know. We suggest an inspection. It is no part of the duty of managers to prohibit the purchase of what is in bad taste, but that which is unmistakably vile should be kept out of the cars. And such an inspection should be more severe than that of the law; for on cars the books and papers are thrust into the notice of the passengers, while in shops they are not likely to be troubled by them unless they ask for them. But we believe the nuisance would soon be abated if it were frequently or even occasionally complained of to the proper authorities. Half-a-dozen letters from responsible parties concerning any abuse will do very much toward abating it.—EDITOR RAILROAD GAZETTE.]

#### Duties and Neglect of Duty of Roadmasters.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have noticed in several numbers of the RAILROAD GAZETTE recently that the question is asked, What is the cause of so many accidents? and while some express one idea and some another, the question remains unanswered, as no two parties seem to agree on any one point. Now I believe that a majority of railroad men will agree with me, that nine-tenths of all accidents that occur are caused by carelessness. How can it be otherwise when so many incompetent persons are placed as the custodians of life and property. I have spent seventeen years in laying railroad track, and I have long since made up my mind that one of the parties most responsible for accidents is the roadmaster. But though this officer's responsibility is fearful, I have been surprised to see how frequently he does not realize it. Nine times out of ten an incompetent person is appointed roadmaster, one who actually does not know whether his track is in order or out of order.

I have never yet in my long experience as a railroad man

ard axles, as indicated by the dotted lines, and returning it to the Secretary, you will aid the Committee in accomplishing what they have in view.

It is also desirable to know, at least approximately, how many of your standard axles are now in use on your road. Please give the number as near as you can in the appropriate blank below.

Yours very respectfully,

LEANDER GAREY, Secretary,  
Morrisania, New York.  
F. D. ADAMS, JOSEPH JONES,  
M. C. ANDREWS, I. W. VAN HOUTEN,  
LEANDER GAREY, A. STEINBACH,  
C. A. SMITH.  
Committee.

Name of railroad.....  
Number of standard passenger car axles of the dimensions  
given, in use on the above road.....  
Number of standard freight car axles of the dimensions  
given, in use on the above road.....

#### Report of the Grand Trunk Railway of Canada.

This company operates 1,377 miles of railroad, of which it owns about 950 miles, the remainder being leased. The directors report as follows the receipts and expenditures for the last half year of 1871:

	1870.	1871.
The gross receipts upon the whole undertaking, including the Buffalo and Champlain lines have £793,740. been .....	£905,341	
Deduct—		
Ordinary expenses (being at the rate of 59.70 per cent., against 67.12 of the corresponding half of 1867, last year).....	2558,567	
The renewals, &c., of the permanent way and works in the half-year debited to 196,101 revenue.....	154,157	719,731
Leaving an available balance earned in the half-year £194,877. of.....	£224,817	
Less amount of sundry expenditure, as per revenue account.....	43,540	
£151,337	£179,077	
8,284. Deduct loss on American currency.....	18,183	
£116,553	£160,894	

To this sum of £160,894 has to be added the balance carried from the net revenue account of last half year of £18,311, mak-

ing a total balance of £179,205; from this, however, has to be deducted the amount of postal and military revenue due for the half year to the postal bondholders of £17,025, leaving the balance of £162,180 applicable for the following payments, viz.:

Car hire (including sinking fund and maintenance and repairs of 700 changeable gauge cars).....	£40,070
Interest, &c., paid on lands.....	£1,648
" on mortgage to Bank of Upper Canada.....	4,434
" on loans, bankers' balances, promissory notes, European exchange, &c. ....	1,815
" on British American Land Company's debentures.....	616
" on Montreal Seminary debentures.....	616
" on Island Pond debentures.....	2,700
Half-yearly installment on Portland sinking fund.....	2,568
Contribution to Chicago Fire Fund.....	1,000
Atlantic & St. Lawrence lease (in full).....	£29,502
Detroit line lease (in full).....	11,250
Montreal & Champlain Railway Company.....	13,706
Buffalo & Lake Huron.....	27,500
First equipment bond interest.....	81,968
Second " " "	8,115
Balance carried forward.....	1,650
Total.....	£162,180

Comparing this half year with the corresponding period of 1870, the gross receipts show an increase of £141,601, or 17.84 per cent. There was an increase in the receipts from passenger traffic of £15,997, or 5.18 per cent.; and from freight traffic of £125,462, or 25.93 per cent. The total number of passengers carried was 961,432, against 937,879, and the tonnage of freight was 789,231, against 691,301. The average receipt per passenger was 6s. 1d., against 5s. 1d., and per ton of freight, 10s. 5d., against 14s.

The large decrease in the proportion of expenses to receipts is largely due to a transfer of the charges for car-hire to the interest account. Including this with the working expenses we have the proportion 64 per cent. in 1871 against 67.12 in 1870. This reduction in the cost of working is accounted for by the improved condition of the road and rolling-stock. There was an increase of about 450,000 miles, or about 14 per cent., in train mileage. Just one-tenth of the track was renewed during the year—a moderate proportion—and 53 of the 137.7 miles with steel rails, making 109 miles of steel rails now in the track. This is about one-tenth of that part of the line where the traffic is sufficient to make steel economical.

There is an addition to the capital account of £452,034, chiefly by the funding of the interest of the preferred bonds and stocks. This increase in capital account is against an increase of about £44,000 in net receipts.

#### Panama Railroad Report.

The following is the annual report of the directors of this company, presented at the annual meeting in New York on the 1st instant. The road is 47½ miles long, and at last reports had 15 locomotives, 23 passenger and 131 freight cars:

The directors take pleasure in reporting that the net earnings

of the road, since the last dividend was declared (January 1, 1871), have been as follows:

For the year ending January 1, 1872.....	\$945,661 65
For the quarter ending April 1, 1872.....	175,561 74

Total.....

Out of these earnings a dividends of five per cent. has been declared, payable April 8.

The cash assets of the company amount to.....

From which deduct—Dividends, payable April 8.....

Interest due April 10.....

Due Government of Colombia for subsidies.....

£350,000 00

£10,000 00

£55,000 00

£395,000 00

Balance.....

In addition, the company own five steamers in the Central American trade, with steam-tugs, launch, etc., in Panama, worth at a moderate valuation.....

£900,000 00

Real estate in the city of Panama, and one-half of islands in the bay of Panama, cost.....

73,000 00

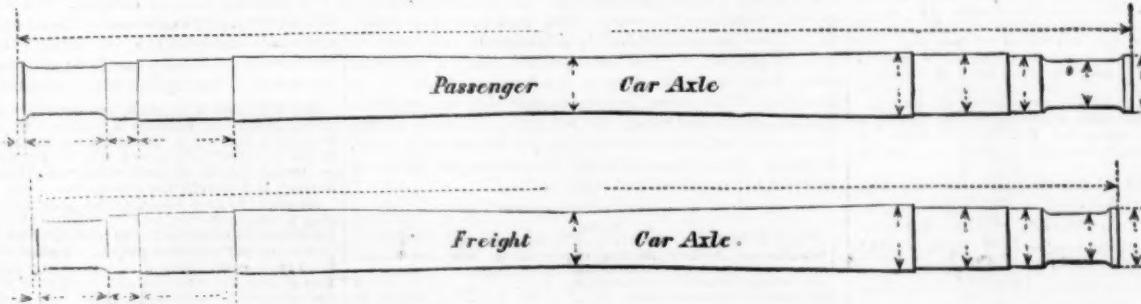
Vacant lands on the Isthmus, about 300,000 acres, of uncertain value.

The road is in good order, and fully equipped.

The directors congratulate the stockholders on the improvement in the business and prospects of the company. From the opening of the Overland Railroad our receipts declined rapidly until the latter part of 1870 and commencement of 1871, when they were barely sufficient to cover the working expenses, subsidy and interest. The loss is almost entirely on the California branch of our business. There was a moderate loss caused by the opening of the Magellan line, which was about balanced by a gain in the Central American trade.

To meet the loss on California business referred to, special efforts were made to divert shipments from sailing vessels, especially from England and the Continent, going around Cape Horn—reduced tariffs of through rates were adopted and new agents appointed. As a result, our receipts have gradually increased, so that the first three months of 1872 amount in gross to \$427,266, against \$271,000 for the corresponding months of 1871—and this without very great help from the diversion of California goods to the Isthmus, caused by the "snow blockade" on the Union Pacific road. This result would have been still more favorable had not the China trade, which was becoming important, been cut off in the fall of 1870 by the arrangement of the Pacific Mail Steamship Company, under which all these shipments were turned to the Overland road. In the matter of diverting goods from sailing vessels by the Horn route, there is still a wide field for effort.

There are at the present time a larger number of connecting lines running to the Isthmus ports than ever before. Some of



seen a track-master walking over his line of road, and it is seldom that he is seen passing over his road in a hand-car; but he is frequently seen passing over the road comfortably seated in the best coach in the train, and once in a great while he may be seen standing on the platform of the rear coach, traveling at the rate of twenty and often thirty miles an hour, as he is generally found on the train making the best time. I ask, what does he know about the state of his track, traveling at this rate? Nothing.

Now, Mr. Editor, I know you will agree with me that no man should ever be placed in this responsible position who is not a thoroughly practical track man. He should never be allowed to take charge of more than sixty miles of track, and he ought to walk over his track at least once every week, and carefully examine the ties, see that they are equally spaced, see that the rail lies equally on each and every tie; see that the spikes are driven uniformly and hold the iron tight to the ties; see that the ties are all kept properly bedded up, so that the iron cannot spring up and down when a train passes over; see that no water is allowed to remain about the ties or on the road-bed, and that no defective tie is allowed to remain under the iron; see that the track is kept in proper line, and that his section bosses never get it out of line; see that the joints are perfect, with not too much space for expansion, nor yet too little; see that his section bosses thoroughly understand their business, and realize the great responsibility resting upon them. When track-masters do this, then, and not till then, will we cease to hear the inquiry, Why do so many accidents occur? Then the public mind may be at rest, and there will be some degree of safety for life and property. No disease can be cured until its cause is removed; and in all cases of imperfections, to remove them, you must begin at the bottom.

E. G. HAIGHT,  
Master Track Layer.

#### Interchangeable Parts for Cars.

Those of our readers who have anything to do with the repairs of cars will be glad to learn that the Car Builders' Association have commenced a systematic effort to establish a standard for those parts of cars which require frequent renewal. The following circular has just been issued by them. It is proposed, when the desired information is obtained, to arrange all the dimensions of the axles in a tabular form, so that accurate comparisons can be made of the different sizes in use:

The want of uniformity in those parts of cars which are most subject to wear and breakage is so serious an evil that the Master Car Builders' Association have determined to try to establish some standard form and size for axles and oil-boxes. As a preliminary step, they desire to learn the dimensions of the axles which are now used on different roads for new cars. By marking on the engraving below the dimensions of your stand-

ing a total balance of £179,205; from this, however, has to be deducted the amount of postal and military revenue due for the half year to the postal bondholders of £17,025, leaving the balance of £162,180 applicable for the following payments, viz.:

Car hire (including sinking fund and maintenance and repairs of 700 changeable gauge cars).....	£40,070
Interest, &c., paid on lands.....	£1,648
" on mortgage to Bank of Upper Canada.....	4,434
" on loans, bankers' balances, promissory notes, European exchange, &c. ....	1,815
" on British American Land Company's debentures.....	616
" on Montreal Seminary debentures.....	616
" on Island Pond debentures.....	2,700
Half-yearly installment on Portland sinking fund.....	2,568
Contribution to Chicago Fire Fund.....	1,000
Atlantic & St. Lawrence lease (in full).....	£29,502
Detroit line lease (in full).....	11,250
Montreal & Champlain Railway Company.....	13,706
Buffalo & Lake Huron.....	27,500
First equipment bond interest.....	81,968
Second " " "	8,115
Balance carried forward.....	1,650
Total.....	£162,180

Comparing this half year with the corresponding period of 1870, the gross receipts show an increase of £141,601, or 17.84 per cent. There was an increase in the receipts from passenger traffic of £15,997, or 5.18 per cent.; and from freight traffic of £125,462, or 25.93 per cent. The total number of passengers carried was 961,432, against 937,879, and the tonnage of freight was 789,231, against 691,301. The average receipt per passenger was 6s. 1d., against 5s. 1d., and per ton of freight, 10s. 5d., against 14s.

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The directors take pleasure in reporting that the net earnings

of the lines propose adding to their service during the coming year.

To encourage emigration to California and other ports on the Pacific, low rates of fare for steerage passengers have been adopted, in connection with the various steamer lines. Arrangements have recently been made to extend the Central American line (which is owned by the company) to five ports in Mexican States north of Guatimala, the Mexican Government having granted the company a favorable contract, with subsidy \$30,000 per annum. During the past winter the trustees of the sinking fund have paid out of their fund sterling bonds to the amount of \$558,875. The amount of bonds now outstanding is £578,150, or \$2,890,750, none maturing earlier than 1897, excepting the small amount of £19,350, which falls due in 1875. The trustees of the sinking fund still hold securities to the value of \$325,000, which, with accumulations and moderate annual appropriations, will retire all the bonds at maturity. Although, from causes beyond their control, the stock of the company has, within the past three years, undergone a severe and painful revulsion, yet the directors (some of whom were connected with the inception of the enterprise) cannot but look back with pride and pleasure to the fact that, since the organization of the company in 1849, \$20,090,000 have been returned to the stockholders. While no such exceptionally profitable results can now be looked forward to, yet the directors cannot but hope that there is still a future of fair remuneration to those interested.

#### Great Western Railway Report.

This company, during the half year ending December 31, 1871, worked 372 miles of road, and during nine months of that time 48 miles more, making an average for the half year of about 388 miles. Of this it owned about 300 miles. The directors report the receipts and expenditures for the half year as follows:

Gross receipts.....	£237,351
Working expenses, including renewals and all charges.....	313,636
Total.....	£550,987
From which is deducted—Interest on bonds.....	£40,379
Discount and charges on conversion of American currency.....	27,819
Amount set aside for renewal of ferry steamers.....	3,000
Loss on working the Erie & Niagara Railway.....	1,082
Alteration of gauge account—proportion charged this half year.....	9,100
Amount paid for repairs and compensation Nith River Bridge accident account.....	5,994
Vote of shareholders to Chicago Fire Relief Fund.....	1,000
Total.....	£125,341
Add profit on working Galt & Guelph Railway.....	£1,140
Add balance of interest account.....	4,670
Total.....	£130,951
Profit on half year's working.....	£131,151
Add surplus from last year.....	4,847
Total.....	£135,998

The aggregate revenue receipts (exclusive of Galt & Guelph), compared with the corresponding half year, exhibit a gross increase of £33,000, as follows: Increase in way passenger traffic, £10,143; through passenger traffic

and live stock traffic, £28,342; through freight and live stock traffic, £32,958; mails and express freight, £2,119; rents, £50; total, £83,003.

This increase is at the rate of 19 per cent. The increase in expenses, including renewals, was £46,155, or 17½ per cent., and these expenses were 59.47 per cent of the receipts, compared with 60.19 in 1870; 57.37 in 1869; and 49.55 in 1868. The large increase in the proportion of expenses under the present management being due to great improvements in the road and rolling stock, and being accompanied by a large increase in net as well as gross receipts, the legitimate result of increased capacity. There has been, however, a considerable addition to the capital account also by the making of these improvements, that for the half year amounting to £284,410; but of this £126,539 was expended in new lines, and £80,175 for 13 new locomotives, 50 new platform cars, 239 new box cars, the increased cost of replacing 50 four-wheeled box cars by the same number of eight-wheeled cars; 6½ miles of new sidings, and the cost over iron of 4,000 tons of steel rails used in renewals. The increase in net earnings was £36,848, but no increase in the rate of dividend is made.

The following comparative statement of traffic receipts is made:

	Half-years ending January 31.	
Passenger Traffic—	1872.	1871.
Way.....	\$443,117 00	\$390,520 87
Through.....	451,568 71	405,864 01
Total.....	\$893,685 71	\$796,384 88
Freight Traffic—		
Way.....	\$591,044 64	\$453,205 95
Through.....	1,034,382 03	873,986 78
Total.....	\$1,625,426 67	\$1,327,189 73
Excess baggage, mails and express freight.....	67,760 41	57,430 94
Total traffic earnings.....	\$2,586,892 79	\$2,181,003 55

The average receipts per way passenger per mile were 2.896 against 2.707 cents the corresponding half-year of 1870; and per through passenger, 2.256 against 2.304 in 1870. The average receipts per mile per ton of way freight were 3.254 against 3.340 in 1870; and of through freight, 1.923 against 1.369 in 1870.

The working expenses per train mile were 4s. 8d. against 4s. 6d. in 1870, 4s. 9½d. in 1869, and 4s. 3½d. in 1868.

"The condition of the roadway may be stated as excellent, enabling trains to be run with great regularity. The use of steel rails continues to prove very satisfactory. Of the 229 miles of main line, 79 miles are laid with steel rails, and it is proposed, during the year 1872, to add about 80 miles more of steel track, and in 1873 to relay the remainder of the main line, 70 miles, with steel rails. On the 31st January the whole of the company's car-stock had been converted to the 4ft. 8in. gauge, but the third rail, affording also the 5ft. 6in. gauge, is still kept down between London and Hamilton, 76 miles, on which to run the broad-gauge locomotives until they can be sold or worn out."

The directors report that the Erie Company's branch to Suspension Bridge has been of great value, and that the relations of that company with the Great Western "cannot fail to be improved by the recent reorganization of the Erie board." They close by saying: "The directors have the satisfaction of stating that the Great Western Railway of Canada is in every respect a sound property. The condition of its permanent way and rolling stock, with its narrow-gauge track throughout and its established connections in the United States, will enable it to claim its full share of the inexhaustible traffic flowing from the Western States to the Atlantic seaboard."

The following is a list of the directors of the company: Sir Thomas Dakin, Cree Church lane, London, President; Gilson Homan, Esq., Sandford House, Kirkstall, near Leeds, Vice-President; Hon. John Carling, M. P., London, Ontario, Canada; Thomas Faulconer, No. 66 New Finchley road, N. W.; Edward H. Green, Esq., No. 22 Old Broad street, London; M. K. Jesup, Esq., New York; Donald MacInnes, Esq., Hamilton, Ontario, Canada; Hon. William Macmaster, Senator, Toronto, Ontario, Canada; Paul Margetson, Esq., Clapham Common; George Smith, Esq., No. 23 Albemarle street, W.; William Weir, Esq., No. 10 Princess Terrace, Dowhill Gardens, Glasgow.

#### Report of the New York & New Haven Railroad.

This company's road is 62 miles long, extending from New Haven eastward to Williams' Bridge, on the New York & Hartland Railroad, by which latter line it enters New York.

The following is a summary of the report for the year ending September 30, 1871, to be submitted to the stockholders at their annual meeting, May 16. The fiscal year heretofore has closed with the month of March, so comparisons cannot easily be made:

The income of the fiscal year was:	
From transportation of passengers.....	\$1,764,175 28
From transportation of freight.....	442,027 01
From transportation of mails and express.....	112,837 46
From other sources.....	39,837 13
Total.....	\$2,358,936 88
The expenditures were:	
Working expenses.....	\$1,914,294 06
Leaving a balance of.....	\$1,144,633 82
From which amount is deducted for—	
Taxes.....	\$144,105 52
Interest.....	63,570 00
Loss sustained by W. Bement.....	88,291 68
Total.....	\$295,967 90

Besides earnings, the sum of \$750,000 was received for a new issue of stock, and there was expended for permanent improvements (real estate, new iron bridges, steel rails, etc.), \$1,364,098. Two per cent. dividends were paid on the stock.

The consolidation of this company with the Hartford & New Haven, under the name of the New York, New Haven & Hartford Railroad Company, has been authorized by law, and an agreement to that effect will soon be submitted to the stockholders.

The renewal of the track with steel rails is to be completed in the summer of 1873.

#### THE RAILROAD GAZETTE.

Master Mechanics of all American railroads are invited to send us their monthly reports for this table.

NAME OF ROAD.	MILEAGE.				No. OF MILES RUN TO	COST PER MILE, IN CENTS.				AVERAGE COST OF OIL, per gallon...
	Passenger... Number of locomotives in service...	Freight... Number of miles per day...	Miscellaneous... Number of miles per day...	Total... Number of miles per day...		Ton of Coal... Cord of Wood... Pine oil (100 lb.)... Barrels...	Rails... Brick, stone, etc... Blaues... Miscellaneous... Engines, etc... magnesia, etc... Total...	Oil, per ton...		
Burlington & Missouri River.....	58	38,861	74,945	30,600	144,406	27.58	48.23	12.09	6.79	10.64 0.61
Cleveland & Pittsburgh.....	74	50,849	144,576	6,774	183,932	55.26	21.85	5.53	4.93 0.69	7.30 18.45
Chicago, R. I. Island & Pacific (Ill. Div.).....	79	41,849	228,390	127,780	30,70	30.70	12.13	10.14	10.04 1.07	7.66 28.91
Chicago, R. I. Island & Pacific (Iowa Div.).....	84	69,594	134,566	223,395	27.13	14.54	6.84	6.84 0.65	7.64 31.20	
Cleaveland, Columbus, Cincinnati & Indianapolis.....	397	163	56,432	191,964	77,026	36.80	22.16	5.02	10.87 0.50	6.96 23.36
Chicago, Burlington & Quincy.....	771.5	118,968	196,111	115,911	430,090	43.49	12.13	10.14	10.04 1.07	7.66 28.91
Chicago & North Western.....	239	182,365	228,390	127,780	30,70	30.70	12.13	9.24	13.00 0.88	8.58 31.68
Illinois Central (Illinois Divisions).....	708,25	149	97,619	320,738	68,911	487,266	31.73	12.86	7.75	6.33 0.68
" " (Iowa Divisions).....	401	38	28,923	50,619	91,425	36.92	18.63	7.41	7.07 0.55	6.50 21.53
Leavenworth, Lawrence & Galveston.....	78	23,537	12,056	6,337	41,981	68.37	36.14	3.29	6.08 0.52	8.06 16.98
Louisville, Nashville.....	78	59,030	115,380	6,069	180,470	44.93	12.03	7.57	12.04 0.69	9.30 30.36
Memphis, Clarksville & Louisville.....	7	3,456	5,685	11,554	27,00	9.00	1.11	5.32	5.00 0.65	2.70
Memphis & Ohio.....	20	19,134	24,971	4,337	117,125	45.430	10.10	9.40	10.00 0.68	9.34 31.79
Philadelphia, Wilmington & Baltimore.....	126	69,570	222,178	11,400	302,146	33.07	17.01	4.98	5.89 0.88	6.60 28.90
Pennsylvania (Philadelphia Division).....	113	54,368	248,751	9,257	312,376	26.66	25.13	5.20	6.80 0.78	13.70
" (Middle Division).....	70	11,090	135,737	1,690	148,497	22.91	12.29	7.90	7.90 1.10	16.80
" (Pittsburg Div., K. End.).....	106	59,411	164,633	11,386	235,930	31.34	16.18	7.50	6.40 0.90	14.90
" (Tyrone Division).....	26	11,290	35,673	3,036	49,988	27.62	23.47	2.19	6.90 0.80	9.30
" (West Penn's Div.).....	19	16,675	23,821	5,451	43,047	40.93	27.33	3.20	4.60 0.60	8.40
" (Lewistown Division).....	0	4,020	8,754	889	13,865	53.83	20.00	9.40	3.70 0.70	13.80
Pittsburgh, Ft. Wayne & Chic. (K. Div.).....	319.2	86,914	299,012	9,446	358,372	40.78	14.44	3.99	5.77 0.84	1.73
" (W. Div.).....	200	96	204,367	30,213	38,213	10.25	18.00	1.90	11.70 0.60	6.90 21.10
Rome, Watertown & Ogdensburg.....	562.9	62,039	28,478	20,978	11,600	60.96	36.49	23.56	5.14 11.42 0.61	6.66 33.52
St. Louis, Kansas City & Northern.....	36	62,039	126,076	53,360	245,845	38.40	15.20	8.10	8.20 0.50	6.30 23.20
Flint & Pere Marquette.....	26	39,227	35,556	16,430	70,215	53.66	32.33	3.20	6.65 0.64	6.14 15.54

The Superintendent reports that 9,531 passengers and 2,608 freight trains passed over the road during the year. There were 2,512,840 passengers carried, their aggregate mileage being 75,313,593 miles. There was no accident to any passenger, and for sixteen years no passenger has lost life or limb on this company's trains, 25,405,708 passengers having been carried by it during that time.

#### SHORE LINE DIVISION.

The statement of the receipts of the Shore Line Railroad, leased by this company, shows that for the eleven months ending with September the receipts from passengers were \$236,201.84; from freight, \$63,925.72; miscellaneous, \$20,644.73—a total of \$320,772.29. The expenses and rent for the same period were \$269,320.66, showing a balance of \$51,451.63. A note says: "It is proper, however, to state that the supply of steel rails for the last season did not arrive in time to go into the account, and, taking into consideration this and other items of expense, it is safe to assume that this road earned just about sufficient to pay the rent and expenses."

#### CONDENSED BALANCE SHEET.

Debtor.	
Railroad, including the franchise, right of way, grading, masonry, bridging, fencing, superstructure, iron, station houses, shops, fixtures, machinery, engineering, interest, discount on bonds, etc.	\$14,490 04
Equipment: engines and cars	900,000 00
Real estate	107,745 66
Permanent improvement and additions	1,364,098 31
Materials and supplies on hand	209,433 23
" " Shore Line Division	59,140 57
Cash in bank, due from agents, connecting roads and corporations	1,908,497 08
Total.....	\$9,992,394 88
Creditor.	
Capital stock: 60,000 shares full paid.....	\$7,500,000 00
30,000 shares 50 per cent. paid.....	2,000 00
Bonds payable December 1, 1868, past due.....	1,059,500 00
due on 1st April and 1st October.....	1,059,500 00
Coupon interest and dividends unpaid.....	33,695 00
Accounts payable: March pay roll and balances due connecting roads.....	261,388 57
Credit balance Shore Line Division.....	51,451 63
Profit and loss.....	1,060,359 68
Total.....	\$9,992,394 88

#### Checking Baggage from New Brunswick to San Francisco.

In a recent number of the Boston Evening Traveller, the following was published:

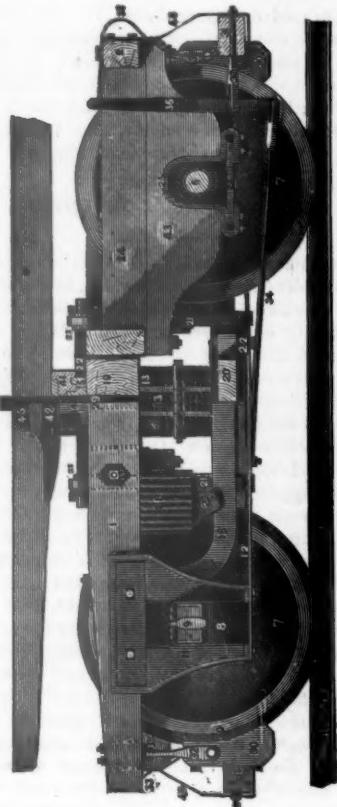
A CARPET BAG ON ITS TRAVELS.—In order to test the shortest time in which the trip from St. John to San Francisco and return can be made, Mr. Clark, General Baggage Agent of the European & North American Railroad, yesterday morning dispatched a carpet bag, checked No. 105, from St. John, N. B., with instructions to baggage masters to push it forward as rapidly as possible, taking note of the time of its arrival and departure. Agents of the Associated Press are requested to give notice of its progress. It passed through Bangor, Me., last night.

This called out a correspondent signing himself "A Reversible Check," who thinks that if this is true Mr. Clark must be more ignorant of the business than a general baggage agent ought to be. He says:

To begin at the beginning; if Mr. Clark is a general baggage agent he ought to know that the Union and Central Pacific roads will not allow any Eastern line to check baggage over theirs. This is positive and peremptory. Then he also ought to know that Boston is the *ne plus ultra* of the Eastern railway system, and that he cannot by any existing process check any baggage whatsoever from St. John beyond this city; here his bag will stick, unless some one presents a duplicate to check No. 105, to relieve the terminal company from responsibility. Then his wife must be transferred to—say the station of the Boston & Albany Railroad—for which there is no system provided, and there be rechecked to Council Bluffs; there, a duplicate check presented, the bag transferred to Omaha and be again checked—to destination.

For the sake of a case, let us suppose he had simply labeled his bag to San Francisco instead of checking it to Boston and that the various agents at terminal points would take pains to "push it through"—which, by the way, is more than doubtful—what could he possibly gain beyond that which is done daily with tons

## PASSENGER CAR TRUCK.



## Dictionary for Car Builders.

The committee of the Master Car Builders' Association, appointed to prepare a dictionary of terms used in the construction of cars, have sent out the following circular to the members of their Association:

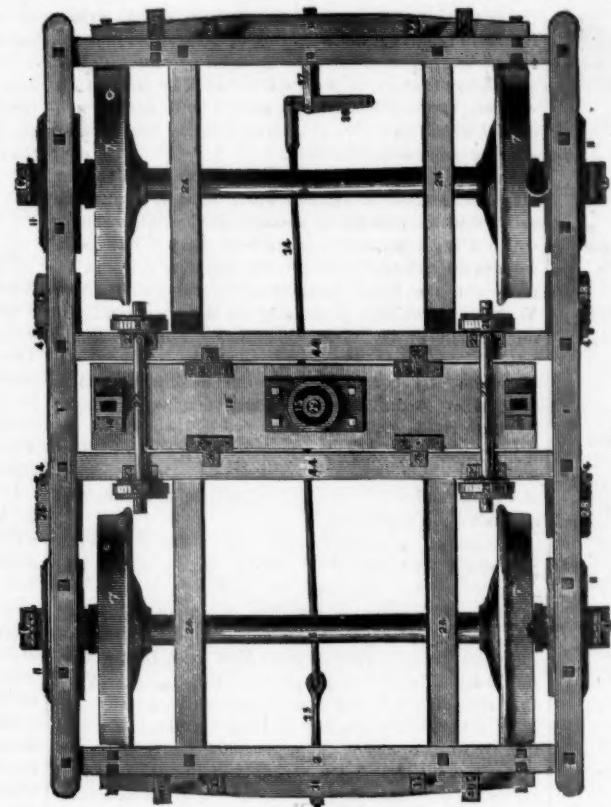
The committee of the United American Master Car Builders' Association who were appointed to publish a dictionary of terms used in the construction and repair of cars, in order to learn the names in common use in different localities, send herewith engravings of railroad car trucks, on which each part is numbered. A blank is also appended herewith, on which you are requested to write distinctly, opposite each number, the name or names used in your shop for the piece designated by the same number in the engraving. Master car builders are requested to fill out the blanks and return as early as possible, to

Leander Gandy, Secretary,  
Morristown, New York.

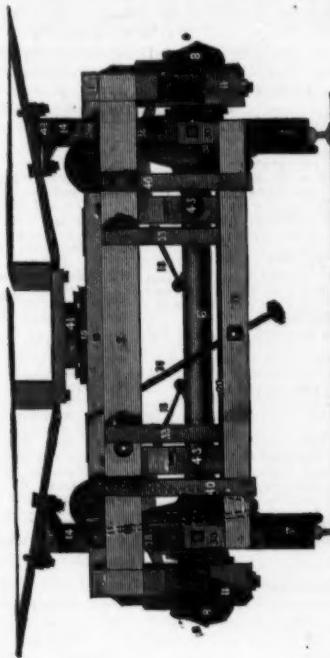
Yours, very respectfully,  
F. D. ADAMS,  
C. A. SMITH,  
M. C. ANDREWS,  
JOSEPH JONES,  
LAUDER GARFEEY,  
I. W. VAN HOUTEN,  
A. STEINBACH,  
Committee.

The engravings we give herewith, but the blank form has been omitted.

Longitudinal Section.

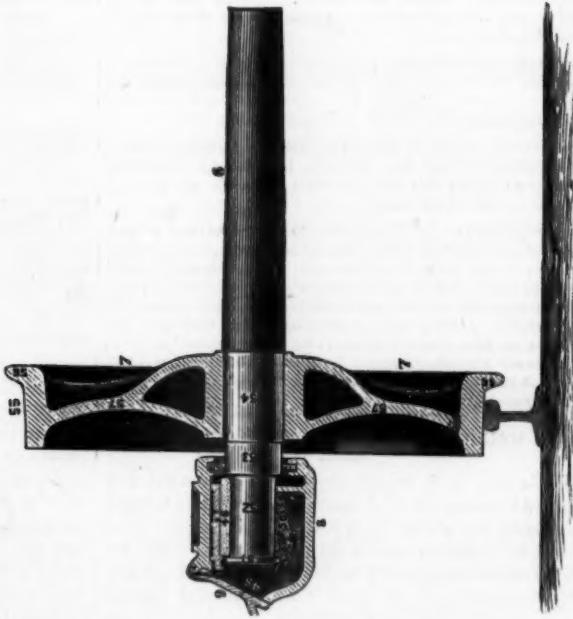


Side View.



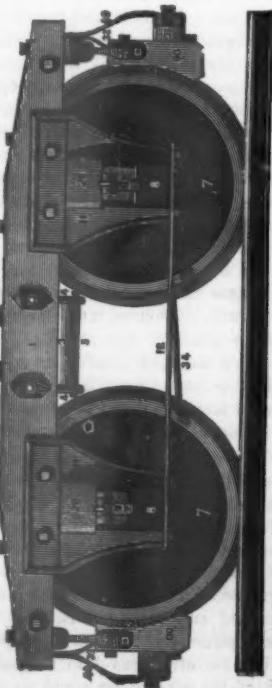
End View.

Section of Wheel and Oil-Bow.

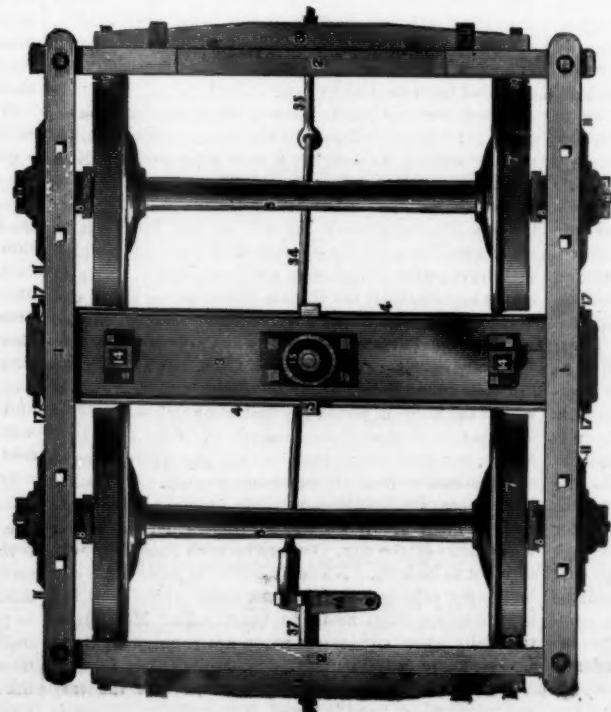


End View.

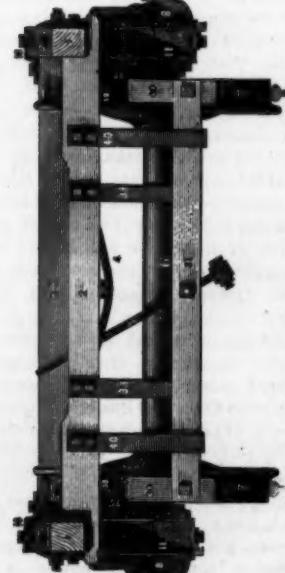
## FREIGHT CAR TRUCK.



Side View.



Plat.





Published Every Saturday.  
A. N. KELLOGG, Proprietor.  
S. WRIGHT DUNNING AND M. N. FORNEY, Editors.  
W. H. BOARDMAN, Acting Publisher.

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## Editorial Announcements.

**Address.**—*The RAILROAD GAZETTE will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.*

**Correspondence.**—*We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.*

**Articles.**—*We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.*

**Inventions.**—*No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

## RAILROADS IN NEW YORK CITY.

While New York receives the traffic of more miles of railroad than any other city in the world, it is yet reached directly by the trains of only three companies, two of which are almost identical in management, while the other reaches the city only by the permission of another. Only two railroads, the New York Central & Hudson River and the New York & Harlem, have tracks in the city. The insular position of the city has prevented most of the roads coming from the West from attempting to take their trains into the city; and these roads naturally are by far the most numerous, as by far the greater part of the country is west of New York. It is true, also, that most of the advantages of these railroads accrue to New York, although their termini are in another city and separated by a great, navigable stream—a great harbor, in fact—which enables these roads to unload their freight into sea-going vessels without moving it into New York. But it is also true that it is a great advantage in all traffic which involves the handling of merchandise of any but the most trifling weight, to be able to load cars as near as possible to the doors of the store or warehouse. So far, nearly all consignments of produce are made to New York firms, and business connected with the trade is done in New York; but a very large share of the produce so consigned never enters that city, but is either transferred directly from car to vessel, or is stored outside of the city, awaiting sale or shipment either to foreign or domestic consumers. And this tendency of heavy produce and goods to avoid New York constantly increases. Elaborate provisions are made for storing and handling such merchandise on the west bank of the Hudson, and the present indications are that in many very important branches of business New York will be represented only by commission houses and offices which only give orders for goods kept elsewhere. Perhaps the tendency is, in the main, to be encouraged. Perhaps it favors simplicity and economy. But however this may be, when

the separation of the counting-house from the storehouse results in removing the latter out of New York, the result, to that city, is disastrous. It is for its interest that all shipments and receipts possible should be made at its wharves, and that merchandise should be stored as well as sold within its limits, at least so long as those limits are extensive enough for both.

Moreover, the separation of the lighter and costlier merchandise from the stations where most of it must be shipped to the interior by a considerable distance, over which it must be hauled in carts or ferried, is a disadvantage the extent of which is less felt than it would be were not the other commercial advantages of New York so great that practically it has no rival. If the business is done in New York at any rate, then the expenses, however extravagant, fall upon the consumer, and the merchant is less mindful of them. But the cartage tax is enormous. Its considerable reduction in many cases would put the city beyond the rivalry of other Atlantic ports in the few articles in which some of them now maintain a considerable trade, and would not infrequently cheapen the cost of goods to the consumer.

Of course, a reduction of the distance between the stores and the cars would immediately and directly reduce the cost of cartage, if this reduction should be to the cars of many competing lines and not to those of one corporation only.

The bill recently passed by the New York Legislature, and likely to become a law, provides that the New York & Harlem Railroad may have permanently the sole use of an entrance into the city in Fourth avenue, in which a costly sunken way is to be provided, partly at the expense of the city. Moreover, it is quite probable that the manager of this company will have given him a charter for the construction of an underground railroad, which will virtually be an extension of the Harlem Railroad to the lower end of the island. The proposed acts provide for certain limitations in the interest of the community, but neither of them compels the companies organized under them to admit the trains of any other corporations. They are left absolute dictators as to what trains shall be permitted to enter the city by this route.

Now, it may be said, that if the "Vanderbilt companies" wish to improve their property by making a costly entrance into the heart of the city, for their exclusive benefit, if we let them do so, and give the right to any other companies to make for themselves a similar entrance, all of them will then be on an equal footing. But this statement is misleading. They will not be on an equal footing. Passing by the fact that the city is required to pay a large part of the cost of a depressed roadway above Forty-second street, there remains the more important fact that it will be almost impossible to secure the right of way for another railroad in a street parallel with the Harlem, even with a sunken or covered way, without purchasing all the lots fronting on that street, at a cost of scores of millions of dollars; and then, doubtless, the owners of property in the adjoining streets would oppose the project bitterly, and not improbably defeat it. Again, it is extremely doubtful whether a second sunken or underground railroad would pay. If the experience with the first should indicate this, it would be just as impossible to obtain money for a second line, as an entrance for new railroads from the North and East, as if the laws prohibited it, and the old corporation would be as effectually secured in a monopoly of the traffic as if all other railroads were excluded from the city by law.

Now it does not matter how a monopoly may be secured; it is equally disastrous to the community whether it be by accident or design. It cannot be well for New York that one corporation should have the power to dictate whether and on what terms freight and passenger trains shall enter the city. It will be well for it if it be made a condition in the charter of any company which shall have power to construct a railroad, under, above or on the surface, from the Harlem River to the lower end of the city, that the trains of all railroads shall be conveyed over it on equal terms.

It is by no means certain that there will be no more railroads from New York to the North and East. It is within the range of possibility that some railroad, new or old, may cross the Hudson north of New York by a bridge, and seek an entrance into the city where alone it is practicable—from Westchester County. Or rather these things are possible—probable, indeed—if provision shall be made securing a way for trains from the border to the heart of the city. Otherwise such lines are pretty sure not to be built. No one is likely to waste money in building a railroad for New York traffic which shall not be able to approach nearer to the city than Morrisania, especially when competing roads are running trains to Union square or the Battery.

A great commercial city cannot afford that the easy and economical handling and transportation of goods

should be restricted or monopolized. If only one corporation shall be able to transport economically, we may be sure that the economy will redound less to the advantage of the merchants and their customers than to that of the corporation; if all carriers, or a large number of them, can avail themselves of this economy, then the city and the country, as well as the corporations, will profit by it.

## THE CAR BUILDERS' CONVENTION.

The constitution of "The United American Railway Master Car-Builders' Association" (which, by the way, is a very cumbersome name) provides that the meetings shall be held annually on the second Wednesday in June. This falls on the 12th of the month this year. The place selected last year for holding the meeting this year was St. Louis. Accidentally the master mechanics were obliged to select the same week for their annual meeting, which will be held in Boston. Of course this is to be regretted, but it is too late to mend the matter now.

It has been suggested that some effort should be made to have the same time and place selected for each meeting in future. This it is thought would be quite desirable for a variety of reasons. It would in the first place, if some sort of mutual understanding existed, enable the two associations to hold their sessions at such times as to enable those persons who occupy the position of both master mechanic and master car-builder to attend both conventions. To do so now requires an absence of two weeks, so that few feel able to attend more than one of the conventions. The inducement for going to either would, of course, be strengthened if there were two instead of only one; so that the average attendance would thus, probably, be very much increased. For various reasons a union of the societies is not now thought desirable, and probably the objects of each are better accomplished by separate organizations than they would be if united; but all the advantages of a union would be gained and none lost by holding the conventions at the same place and time. There are plenty of precedents for such a practice, as, for example, what is known as "anniversary week" in Boston and New York, when many of the religious, charitable and philanthropical societies hold their annual meetings. The New York Tribune before us contains the announcements of fourteen anniversary meetings to be held during the next week. The British Association is organized in such a way that the different branches of science have each a separate division, and when the annual meeting occurs, they hold their meetings independent of each other, so that any one attending the annual gathering has an opportunity of being present at the sessions of any of the departments.

On another page we reprint two of the circulars which have just been sent out by one of the committees of the Car Builders' Association. One of these is intended as the first step toward the compilation of a dictionary of terms used in car construction and repairs. That such a dictionary is much needed, all who have had occasion to order or in any way refer to the different parts of cars know very well. Should the plan of the car-builders be carried out successfully, it will be the nucleus of a dictionary of terms used in railroad construction and operation, which is now very much needed and is growing more necessary every day. This circular has been very much delayed by the engravings, and as there is but little time before the convention meets, all who receive it should be as prompt as possible in making their replies.

We also reprint another circular from the same committee, the object of which is to obtain the information requisite to enable the Association to act intelligently in regard to the adoption of some standard forms and dimensions of the parts of cars which require most frequent renewal. The first thing to be done in this direction is the adoption of some standard for car axles. Now each road, almost, has its own, which, with the interchanging of cars, causes endless confusion, delay, expense and trouble. It will, of course, require very great care and discretion to establish any standard, and it should only be done after the most careful investigation and comparison. If the committee will simply collect and arrange in a tabular form the dimensions of axles, it will at least supply the data from which to determine the best proportions for a standard axle.

If the Association will continue to agitate the subject of car ventilation, it will be doing a very good thing. We have so often called attention to this subject that perhaps what we say may begin to sound too much like an oft told tale, and make no impression on those who most need to be impressed. The question which should be pondered, understood and answered is, how much fresh air should each passenger have to breathe each minute, and how is it to be introduced into the car? If the annual meeting of the car-builders could so agitate this simple inquiry as to lead each of them to go home

and attempt to answer and devise a solution for it, their assembling together would not have been in vain.

There has been a good deal of discussion of late in regard to the value of check-chains on car trucks, as a safeguard to prevent trains from leaving the track should they get off of the rails. It is urged by some that if the car wheels get off of the rails the truck will run a considerable distance on the cross-ties without serious damage to the passengers, providing it is kept in line and does not get crosswise of the rails. On the other side, those who think check-chains do not add to the safety of traveling say that it is impossible to attach them so that they will not break loose in case of an accident, and in that event there is danger that the timbers of the car will be torn out by the truck, and thus more damage be done than would result if there were no check-chains. If a committee were appointed on this subject who would address a circular letter to all of the members with inquiries referring to these points, and asking for the experience of those who have used and those who have not, doubtless such information would be procured as would determine definitely whether such attachments have any value as a safeguard.

We would also like to speak for suffering humanity, and ask the gentlemen who will assemble in St. Louis to consider whether a more comfortable form of seats could not be devised. We protest, after many hours of suffering, that the width of car seats, measured from the back to the front, is almost always insufficient for comfort. If they were made eighteen inches, so as to support a larger portion of the body, or, to use a mechanical phrase, "give a larger bearing surface" to the body, they would increase the comfort of riding in them immensely. We also want to lift up our voices against the practice of making car seats *convex* instead of *concave*. Their comfort would be increased many-fold if they were made to conform to that portion of the human body for which they are devised. If, therefore, some apostle of human comfort would cry aloud in the convention against this error and convince all who hear him that stuffing seats convex instead of concave is a heresy of upholstery, he will earn the gratitude of the whole traveling community.

Much of what we said last week regarding the Master-Mechanics' Convention is applicable to that of the car-builders, and therefore need not be repeated. The greatest danger to which these associations are exposed is the indifference of their members, which will be certain to exist if those who should be contributing information and preparing reports do not perform their duty. No man who belongs to such an association has a right to complain of a want of interest in its deliberations, if he has not put his shoulder to the wheel and contributed of his own knowledge for the benefit of others. It is not yet too late to do so, even if it has thus far been neglected.

#### The Grand Trunk Report.

It must be difficult for the proprietors of this property to find much comfort in the recent half-yearly report for the last half of 1871. It is true that a considerable increase of earnings is shown—nearly 18 per cent.—and an increase of net earnings of more than one-third; but the various expenses, rentals, etc., absorb all this and leave nothing for first, second, third and fourth pre-erred bonds and stocks, the interest of which goes to increase the capital account. The report says that traffic has been conducted at rates somewhat higher than in 1870, but lower than in previous years and lower than "may fairly be anticipated in the future." In this we think it is mistaken. The tendency of rates in this country is unmistakably downward, and this is especially the case with rates on traffic between the Northwest and the East, which is the largest part of the Grand Trunk's through business. New competitors are coming into the field, and the tendency is to carry a much heavier traffic at reduced rates, and as the Grand Trunk has the long route, for most of this traffic, rates which may leave a very small margin for profit on shorter lines, and give them a large aggregate profit, may leave it with no profit at all, so that no increase of business can help it.

But the company can legitimately hope for an increase of profitable traffic from many of the new lines in Canada and from the growth of the Dominion, which is constant and absolutely rapid, though not relatively to that of the Western United States. Something, doubtless, will be diverted by the North Shore Railway between Quebec and Montreal, but we do not see that this will be likely to effect Grand Trunk traffic much, except that between Montreal and Quebec.

One thing is evident, however: the road is being improved and serves the country through which it runs much better than it used to. Some of the improvements are likely to make a permanent reduction in expenses,

and if they are not accompanied by too large an increase in the capital account, there may be hope yet for some of the preferences. But the extravagant and unreasonable capital account will always hang like a millstone around the neck of this property; for if at any time it shall be able to earn a tolerable interest on its capital, some competing line is likely to be made at about one-sixth the cost and make remunerative returns to its proprietors on less than the present earnings of the Grand Trunk. In fact the present earnings are by no means contemptible. For the year 1871, on the 1,377 miles, they were £1,711,223, which is at the rate of about \$6,800 per mile in American currency, the net proceeds of which ought to be enough to pay 6 per cent. interest on \$40,000 per mile, which would be ample, we are sure, to replace such a road as the Grand Trunk by quite as effective and permanent a structure, even though it should lack some of its "monumental" engineering structures.

#### The Great Western of Canada.

The report for the last half year of 1871, a summary of which we give elsewhere, shows a healthy condition in the property and its traffic. More than one-third of the main line was laid with steel rails at the close of the year, and arrangements were made to renew 80 miles more with steel the current year, and the rest in 1873, when the cost of maintenance of way will doubtless be very largely reduced. The rolling stock has been increased and improved, and good progress made in the construction of the new Air Line, which is to give it a shorter route to Buffalo and one with easier grades. The increase in traffic has been very large. The receipts for the entire year were £986,242, against £853,240 for 1870, the increase being nearly 16 per cent., and the total receipts at the rate of about \$14,300 per mile in American currency, a trifle more than three-fifths of which was from through traffic.

There has been much speculation as to the probable effect of the completion of the Canada Southern on the traffic of the Great Western. It has been argued that, as the latter will be exceptionally effective for carrying through traffic, it will be likely to divert from the Great Western a large portion of this, its chief business. But it must be remembered that the Great Western controls the through traffic from many hundreds of miles of railroad west of its western terminus. It works the Detroit & Milwaukee, and has a contract for a considerable term of years for an interchange of traffic with the Michigan Central. Now the Michigan Central does not mean simply a line from Detroit to Chicago, but a great system of railroads (nearly all in Michigan) controlled directly by it and amounting to more than a thousand miles of road; while in case a combination is made to turn the traffic of railroads west of Chicago upon the Canada Southern to the exclusion of the Michigan Central, the latter probably could and would secure to itself solely, and consequently to the Great Western, the through traffic of about 3,000 miles of some of the best placed railroads west of Chicago.

This makes the contract of the Great Western with the Michigan Central of immense importance to it. If it had not been made it is not at all improbable that the Canada Southern would have been built to Detroit, and the Great Western have lost more than three-fourths of its through traffic.

#### The Use of Bridges over Navigable Streams.

The Clinton Bridge over the Mississippi, by which the Chicago & Northwestern crosses into Iowa, would now be convenient for the use of the Chicago, Burlington & Quincy Company, which has recently completed a branch road from Mendota to the Mississippi at that point. The bridge is owned by a corporation known as the Albany Bridge Company, but is leased solely to the Northwestern, which does not intend to let a rival into its field if it can help it. It is said that there is no provision in the charter of this bridge company, compelling it to permit all companies to cross on equal terms, as is usually the case; and, therefore, the Burlington Company has this season procured a separate charter, by which it is authorized to construct a bridge right alongside the old one. But, meanwhile, it is said that there is a chance that it may gain the use of the old bridge by a reservation in the lease to the Northwestern in favor of the Albany & Mendota Railroad Company. Now it is claimed that the new branch was built under the charter of the Albany & Mendota Company. The Chicago, Burlington & Quincy has had a large force at work, constructing approaches, which were said to be for a railroad ferry, but which looked as if they might be intended to connect with the track over the bridge. The Northwestern has kept a force watching and executing works which will prevent a connection, and, at last advices, had obtained an injunction restraining the Burlington Company from making the connection.

Everything in this case, of course, depends upon the law. But the example is worth bearing in mind in case of future bridge legislation. There are two great objections to the exclusive use of bridges over navigable streams. One is their great cost, which frequently will forbid the construction of a line otherwise practicable and desirable; and the other is their

obstruction to navigation, which in nearly all cases is considerable and not infrequently formidable. There is probably not a double-track railroad bridge in America that is worked up to one-fifth of its capacity, and there is no valid objection against the use of such structures by different companies. Already it has been proposed to construct a new bridge over the Ohio at Louisville at a cost of a million or so, and similar costly structures are multiplying often where a few miles of railroad at a quarter of the cost would secure just as good a crossing a few miles further up or down. At the present rate it seems possible that before many years have passed river craft on some of the streams will never be out of sight of bridge piers.

Of course, if companies are given exclusive privileges they must be expected to use them whenever it appears to be for their interest, and if a rival company can be kept from diverting a considerable traffic by refusing it a crossing over a bridge, there will be little hesitation at refusing. It is also probable that the refusal will be made when the result will be on the whole disadvantageous. A strong company will not be kept from a desirable connection by the want of a bridge; if it can't get the use of one already built it will build one. Then the company controlling the old bridge loses the traffic diverted by its rival just the same (but not quite so soon) as if it had put no obstacles in its way; and in addition loses the income which it might have gained for the use of its structure. It is all very well to refuse your rival the use of your property so long as you can keep him from competing with you; but when it is evident that he will compete at whatever cost, the best plan usually is to grant him all the facilities possible at the highest price he will pay. So the very business he takes from you helps to support you; whereas if you compel him to provide his own facilities you lose much and gain nothing.

#### Sale of the Alabama & Chattanooga Railroad.

The Alabama & Chattanooga Railroad, which since its completion has led a life of change, was sold under a foreclosure, made at the instance of the State of Alabama, on the 23d ult. at Montgomery, Ala., the purchaser being an agent of the State of Alabama, at the price of \$312,000. The State issued its bonds in aid of this company, or guaranteed the company's bonds, to the amount of nearly five millions, and the company has failed to pay the interest. The road is exceedingly well placed, forming a section in what is nearly an air-line from New Orleans to New York, with excellent connections to Mobile and to Vicksburg, which latter will make it part of a short route from the Texas & Pacific Railroad to all seaports as far north as Norfolk. It extends for nearly its entire length through what is called the "up-country" of Alabama, the southern section being somewhat mountainous. By far the largest part is within the limits of the State of Alabama; but it has tracks in four different States—two or three miles only in Tennessee, about twenty in Georgia, and less than twenty in Mississippi—forming a direct route from Chattanooga southwest to Meridian, 296 miles. The company lost control of the road nearly as soon as the last rail was laid, and when, if reports may be trusted, it was in a most wretched condition, with very little more rolling stock than was needed for construction. There have been foreclosures in at least three different States, and for most of the time since the completion of the road only part of it has been operated. There are many claims against the company besides those of the State of Alabama, and suits were brought by some of the claimants in the United States Circuit Court at Mobile to enjoin the sale; but the decision was against them.

The sale included the entire line of the road, but did not include some real estate and buildings in Chattanooga, hotel property in Atala, Ala., certain lands donated by Congress, the telegraph lines and some other property which has been owned or managed by the company.

As the total funded debt of the company is but \$25,000 per mile, if the floating debt shall prove not to be enormous, any tolerable management ought to make this a good property. The country on the line is thinly peopled and the towns are small, but there are valuable mineral resources as yet little developed, a somewhat productive country, partly suited for cotton and partly for grain and stock, and the road is one of the best for through traffic between the Northeast and the Southwest.

#### Meetings and Conventions.

*The American Society of Civil Engineers*, No. 63 William street, New York, May 15, at 2 p.m. The annual convention will be held in Chicago on the 5th of June.

*The American Railway Master Mechanics' Association* will hold its annual convention in Boston on the 11th of June.

*The United American Railway Master Car Builders' Association* will hold its annual convention in St. Louis on the 12th of June.

*The New York Society of Practical Engineering* will hold its monthly meeting in the Geographical Rooms, Cooper Union, New York, on Wednesday, May 8, at 7½ o'clock p.m. Papers will be read by Eugene Le Hardy de Beaulieu, C.E., on "Delcambe's Typographical Machines," by H. L. Brevoort, M.E., on "Steam Engine Indicators."

*Polytechnic Association of the American Institute*, Cooper Union, New York. Every Friday evening at 8 o'clock.

All the above meetings will be open to the public, excepting those of the Civil Engineers' Society.

**DISORDERLY CONDUCT** is not easily punished, and, except by taking the law into one's own hands, not easily repressed on a railroad train, for want of officers of the law or time to get them. Your bully or ruffian or thief knows that there is scarcely a chance that any one on the train will have an opportunity to swear out a warrant against him or to get an officer to arrest him before he is out of the way. To provide for these persons

The Massachusetts Legislature have recently passed a law authorizing the commissioning of conductors and station agents as special constables, with power to arrest disorderly persons without warrant at stations and on trains.

The fact that on passenger trains there is usually a considerable number of able-bodied men, some of whom are usually ready to take the responsibility of aiding in the repression of flagrant disorderly conduct without troubling themselves about warrants, has prevented the more frequent outbreak of roughs on trains; but the giving of legal authority to a train officer not only makes it easier to repress violence, but also renders it possible to punish outrages by the penalties of the law; and the presence of an officer with power to arrest will have a preventive effect also.

**TEXAS & PACIFIC** is the new name made for the Texas Pacific Railroad Company, by an act which has now passed both houses of Congress, at the instance of the company. This act provides that the road shall be of the standard gauge of 4 ft. 8½ in., and that the company shall construct 100 miles from the eastern terminus within three years, and not less than one hundred miles per year thereafter, and begin construction at the western terminus next year, and build not less than twenty-five miles per year from that end, and that it shall complete its entire road within ten years. It authorizes the company to issue bonds to the amount of \$40,000 per mile, and to include in its mortgage to secure these bonds any lands which it may acquire by consolidating with other companies which have land grants along its route. There was not much opposition to the bill.

Immediately after the passage of the bill it was announced that Gen. G. M. Dodge, of Iowa, who had charge of the construction of the Union Pacific Railroad and in that capacity showed remarkable executive ability, having under him a small army of engineers, was appointed Chief Engineer of the company, and that the work of construction would be begun immediately. For about 400 miles in Texas the route is through a productive and rapidly growing country, and there is little doubt that this part of the line can be made profitable, even should some financial crisis, or other untoward event not now anticipated, prevent the completion to the Pacific.

The company holds its annual meeting on the 20th inst., at which, doubtless, this act of Congress will be accepted, and, probably, some changes be made in the directory.

**THE NEW YORK & NEW HAVEN RAILROAD COMPANY** is one of the most successful transportation companies in the world, if we judge it by its earnings. With a road only 62½ miles long, it earned during the year ending September 30, 1871, \$2,358,926.88, which is at the rate of \$37,500 per mile. The expenses being \$1,510,261.26, or 64 per cent., we have net earnings at the rate of \$13,600 per mile. The earnings per mile doubtless are larger than on any other American railroad.

## Chicago Railroad News.

### Illinois Central.

The station where the tracks of this and the Michigan Central diverge, going out, lately known as Calumet, has been named Kensington.

Two of the companies' suburban trains, generally known as "Hyde Park trains," now run as far as Dolton, where the Pittsburgh, Cincinnati & St. Louis crosses, 17½ miles from the Chicago depot. The rate for commutation tickets from Chicago to Dolton are \$20, and to Kensington \$17.50 for 100 rides.

### Chicago, Burlington & Quincy.

This company will on Monday, the 6th of May, run through trains from this city to Dubuque, Iowa, without change of cars. The route will be from Aurora via the Chicago & Iowa road to Forreston, thence on the Illinois Central to Dubuque. Mr. J. M. Horton, who has been Secretary to Superintendent Harris, has been made general agent for the road, to be stationed at Clinton, Iowa. E. S. Washburn, for a long time connected with the freight department of the road in this city, will take the place of Mr. Horton.

### Michigan Central.

The Jackson, Lansing & Saginaw road, which is intimately connected with this road, is finished to Wells, about 156 miles from Jackson, and about 55 miles north of Saginaw. The work is being pushed rapidly toward toward the Straits.

### Chicago & Alton.

The earnings of this road from April 16 to April 23 were \$98,511.08. The earnings of the road for the corresponding week last year were \$99,296.16—a decrease for the present year of \$785.08.

### Pullman Palace Car Company.

At the present time there are 80 Pullman palace cars arriving at and departing from Chicago every day. The amount of money expended in their manufacture ranges from about \$10,000 to \$30,000 for each car, the average cost being about \$16,500. The amount of capital, therefore, invested in the Pullman cars which accommodate the business of Chicago, amounts to about \$1,300,000. It is reported that the company has purchased a large piece of ground somewhere in the suburbs of the city, on which they will shortly erect large shops for the manufacture of their cars.

### Chicago & Northwestern.

The annual meeting of the stockholders and bondholders for the election of directors will be held in Chicago on the 6th of June. The transfer books were closed April 30 and reopened June 8. There has been lately some competition in securing the stock which has led some to believe that there would be an attempt to change the management. Only one-third of the directors go out, however, and it is said that there is hardly a possibility of a majority against the present management.

The President of the company, Mr. John F. Tracy, who has been in Europe for the past year, will return before the election, it is reported.

This company is pushing forward vigorously the completion of the Peninsular line, from Marietta to Escanaba, a distance of 63 miles. It is all to be completed this season, thus forming an unbroken line from Chicago to Marquette, and rendering the rich mineral region of Lake Superior accessible at all times of the year. Work is progressing rapidly on the Winona & St. Peter road from New Ulm to the line of Dakota Territory; and when the break in the Northwestern between Reedsburg and Trempealeau shall be completed, there will be an unbroken railroad communication between Chicago and the eastern boundary of Dakota Territory. This latter gap is only about 60 miles, and is all under contract. The work on the tunnels is going forward satisfactorily.

### Chicago, Clinton & St. Joseph.

The surveys on the projected road from Clinton to Indianola, Iowa, are going on, and the track will be laid between the former city and Iowa City by the first day of August.

### Chicago & Iowa.

This company proposes shortly to build a connecting line from Aurora to Joliet, thus connecting the road with the Joliet "Cut-off."

### Chicago, Rock Island & Pacific.

This company is hard at work building a short line from a point near Edgerton, Mo., to Atchison, Kansas. It is expected that the link will be completed about the 15th of May, at which time the Atchison, Topeka & Santa Fe road will be completed between Topeka and Atchison. This will give the Southwestern Branch of the Chicago, Rock Island & Pacific road direct communication with the great Texan cattle ranges of Kansas, and is expected to add a large item to its freight business. This company is also pushing forward its line from Sigourney, Iowa, toward Indianola and Winterset, in the same State.

## General Railroad News.

### ELECTIONS AND APPOINTMENTS.

—At the recent election of the Buffalo Junction Railroad Company, the following gentlemen were chosen as directors: C. Vanderbilt, W. H. Vanderbilt, H. F. Clark, Augustus Schell, Jas. H. Bunker, Samuel F. Barger, Joseph Harker, Harry Allen, New York; George J. Whitney, Rochester; E. D. Worcester, H. R. Pierson, Albany; J. Tillinghast, James M. Marvin, Buffalo.

—G. W. Mitchell and Platt Smith having resigned their positions as directors of the Iowa Pacific Railroad Company, J. A. Rhomberg and Wm. Andrew, of Dubuque, who are members of the Chicago, Dubuque & Minnesota Directory, have been chosen in their places, and J. K. Graves, President of the latter company, succeeds Mr. Mitchell as President of the Iowa Pacific. The directors now are: President, J. K. Graves; Vice-President, H. L. Stout; Directors, J. K. Graves, H. L. Stout, Wm. G. Stewart, Wm. B. Allison, R. A. Babbage, J. A. Rhomberg and Wm. Andrew.

—Under an act passed recently by the Missouri Legislature, the directors of the Hannibal & St. Joseph Railroad Company classified themselves on the 26th ult. as follows: To serve three years, H. N. Smith, B. F. Carter, A. H. De Forest; two years, E. S. Higgins, J. P. Acker, Jay Gould; one year, J. Van Schaick, D. S. Miller, George Cecil.

—The annual meeting of the stockholders of the Harlem River & Portchester Railroad Company was held April 26, and the following were elected directors: Nathan A. Baldwin, of Milford, Conn., President; Wilson G. Hunt, New York; Ezekiel H. Trowbridge, New Haven, Conn.; G. N. Miller, New York; Abraham R. Van Nest, New York; James H. Hoyt, Stamford, Conn.; George B. Carhart, New York; Wm. B. Bishop, Bridgeport, Conn.; William E. Barnett, New Rochelle, Secretary; Frederick G. Clark, New York; John T. Shelton, Bridgeport, Conn.; Treasurer; John Hunter, Westchester; Edward I. Sanford, New Haven.

—The stockholders of the Central Ohio Railroad Company held a meeting in Columbus, O., April 24, and elected the following directors: Hugh J. Jewett, Joseph R. Swan, Wm. Dennison, Columbus, O.; Walter B. Brooks, Baltimore, Md.; John H. Heaton, St. Clairsville, O.; Daniel Applegate, Zanesville, O.; John King, Jr., Joseph H. Reeman, Joseph W. Jenkins, James Harvey, Baltimore; W. C. Quincy, Columbus; William H. Clement, Cincinnati; Joseph B. Ford, Wheeling, W. Va. The board immediately organized by electing the following officers: President, Hugh J. Jewett; Treasurer, Daniel Applegate; Secretary, W. Wing. All these are re-elections.

—At the annual meeting of the Addison Railroad Company, at Rutland, Vt., on the 22d ult., Messrs. John B. Page, E. H. Birchard, Lawrence Barnes, G. Rich and A. B. Waldo were elected directors.

—The Tuscarawas Valley Railroad Company, of Ohio, organized in Cleveland, on the 24th ult., by the choice of the following directors: James Farmer, N. P. Payne and A. B. Stone, of Cleveland; J. A. Saxton and George Cook, of Canton; D. L. King and J. F. Seiberling, of Akron. The next annual election is to be held in Akron on the third Monday of April, 1873.

—Mr. T. D. Lovette has resigned the office of Chief Engineer of the Cincinnati, Rockport & Southwestern Railroad, and Mr. H. R. Weeks, an engineer of ability and experience, has been appointed to the vacant position.

—At the annual meeting of the New Orleans, Jackson & Great Northern Railroad Company in New Orleans, on the 15th ult., the following were chosen directors: Henry S. McComb, Wilmington, Del.; Thomas A. Scott, Philadelphia; William Thaw, J. N. McCullough, Pittsburgh; J. B. Alexander, Cyrus H. McCormick, New York; A.

M. West, Oxford, Miss.; John C. Lucas, L. E. Houston and E. H. Saunders, Mississippi; E. H. Summers, Richard Pritchard, C. H. Slocumb, Lewis Alcus, F. J. Pratt, E. J. Forstall, A. Schreiber and W. Alexander Gordon, New Orleans. Henry S. McComb is re-elected President and R. S. Charles Secretary and Treasurer.

—The directors of the Peoria, Atlanta & Decatur Railroad Company have chosen John T. Lindsay President, A. N. Dill Vice President, Joseph H. Stevenson Secretary, W. E. Stone Treasurer, and R. G. Ingersoll Attorney.

—The St. Joseph & Denver Railroad Company announce the appointment of W. H. Sheridan as Superintendent, and E. Whiting as Chief Engineer, vice J. F. Barnard, who formerly held both positions.

—The Chariton & Oskaloosa Railroad and Mining Company accepted articles of incorporation at a meeting in Chariton, Iowa, on the 18th ult., and chose the following directors: S. H. Mallory, L. Fickle, M. U. Gartner, John Fitzgerald, David Remick, James Hogland, Robert Coles, Thomas E. Palmer and James D. Wright. This board organized by the election of the following officers: President, S. H. Mallory; Vice-President, James Hogland; Secretary, E. B. Woodward; Treasurer, E. A. Temple; Executive Committee, S. H. Mallory, John Fitzgerald and J. D. Wright.

—Richard Orloff has been appointed Trainmaster of the Terre Haute & Indianapolis Railroad.

—S. Robertson, late General Superintendent of the Northwestern Telegraph Company, has been chosen Vice-President, and Charles H. Haskins, late Superintendent of the Pacific & Atlantic Telegraph, has been appointed to the office thus made vacant.

—Gen. Granville M. Dodge, of Iowa, Chief Engineer of the Union Pacific Railroad during its construction, has been appointed Chief Engineer of the Texas & Pacific Company, and has started for Texas to organize for construction. Mr. Dodge has remarkable ability as an executive engineer.

## TRAFFIC AND EARNINGS.

—On the 23d a very large reduction was made on freights on the Union Pacific Railroad between Omaha and Denver. The reduction to Denver is from \$2.60 per hundred pounds to \$1.50 for first-class freight; from \$2.00 to \$1.25 for second-class; from \$1.65 to \$1.00 for third-class. As the Kansas Pacific controls the line from Cheyenne to Denver, it is not likely that it will bear any share in this reduction, but that the Union Pacific is carrying Denver freight for next to nothing. The entire distance is about 620 miles.

—The earnings of the Erie Railway for the third week of April were: 1872, \$434,175; 1871, \$351,108; increase, \$83,067, or 23 per cent.

—The estimated earnings of the Kansas Pacific Railway for the second week of April were: from freight, \$38,311.82; from passengers, \$35,085.80; total, \$73,397.62.

—The Erie Railway reported its earnings for the second week of April as follows: 1872, \$423,020; 1871, \$351,107; increase, \$71,918, or 20 per cent. The increase for the first two weeks of April was \$127,478, or 16½ per cent.

—The earnings of the St. Louis & Iron Mountain Railroad for the third week of April were: 1872, \$45,985; 1871, \$26,731.58; increase, \$19,253.42, or 72 per cent.

—The earnings of the St. Louis, Alton & Terre Haute Railroad for the second week of April were: 1872, \$25,052; 1871, \$28,941; decrease, \$3,889, or 13½ per cent.

—The earnings of the Lake Shore & Michigan Southern Railway for the third week of April were: 1872, \$36,334; 1871, \$283,807; increase, \$52,527, or 18½ per cent.

—The earnings of the Toledo, Wabash & Western Railway for the third week of April were: 1872, \$98,720; 1871, \$104,084; decrease, \$5,364, or 5½ per cent.

—The receipts of the Chicago & Alton Railroad for the third week of April were: 1872, \$98,511.08; 1871, \$99,296.16—decrease, \$785.08, about ½ of one per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending April 18 were: 1872, £37,100; 1871, £32,900; increase, £4,200, or 12½ per cent.

—The earnings of the Great Western Railway of Canada for the week ending April 12 were: 1872, £24,548; 1871, £18,589; increase, £5,959, or 32 per cent.

## OLD AND NEW ROADS.

### Atlantic & Great Western.

The company offers in England the balance of the "reorganization bonds" to supply means for laying a third rail.

It is reported that the New York Stock Exchange has refused the application of the company to have its securities put on the list for call, assigning as a reason that they are too inflated to be safe, which seems a strange reason to be given by a body which still calls Mariposa and Boston, Hartford & Erie.

### Central Pacific.

The law giving the Central Pacific the use of a part of Goat Island in San Francisco harbor, for terminal station buildings, has passed the House.

### Paris, Neoga & Southwestern.

A company with this name has been organized in Illinois, intended to construct the Illinois section of the proposed Toledo, Kokomo & St. Louis Railroad.

### Erie & Michigan.

The following is a telegram from Buffalo dated August 23:

"The Canadian shore, opposite this city, has been a scene of excitement during the past few days, in consequence of an attempt, by William A. Thompson, on behalf of the owners of the Erie & Niagara Railway, to obtain possession of the road, which had been leased to the Great Western Railway Company of Canada for five

years. The lease having expired, the Great Western attempted to hold possession of the road as security for bonds held against the Erie & Niagara. It is reported that last night Thompson's party tore up a portion of the track leading out from Fort Erie, also destroyed a culvert and burned the bridge at Frenchman's Creek, beside turning the Great Western's agent out of the freight-house. This afternoon, about 50 roughs crossed from this city to Fort Erie, who said they were employed at high wages to keep possession of the road."

#### St. Louis & St. Joseph.

The bondholders of this company have voted to refuse an offer of the St. Louis, Kansas City & Northern Company to lease the road, and have taken steps for a foreclosure. Their road extends from the Missouri River, opposite Lexington, northeast to St. Joseph, crossing the North Missouri a very few miles from Lexington. If the St. Louis, Kansas City & Northern does not take it, it can be worked to advantage by the Missouri Pacific, as with its Sedalia & Lexington Branch it would form a very direct line from Sedalia to St. Joseph, and give the Missouri Pacific a sensibly shorter route to St. Joseph and all the towns above it.

#### Julesburg & Denver.

The Union Pacific is having a survey made for the proposed narrow-gauge road between these two places, to connect with the Colorado Central, which the Union Pacific controls.

#### American Fork Railroad.

This company is constructing a railroad of 3-foot gauge to extend from a junction with the Utah Southern (also of 3-foot gauge) to the Miller mine, a distance of 15 miles. It is intended specially for the use of the mines. Mr. Wm. Mason, of Taunton, Mass., has recently concluded a contract with Mr. Edmund Wilkes, the General Manager of the company, for the construction for this road of two single-boiler Fairlie locomotives.

#### Denver & Rio Grande.

On the 23d ult. the track had been extended within 20 miles of Pueblo, and the road was 96 miles long. Arrangements are reported to have been made for shipping government freight destined for New Mexico and Eastern Arizona, to be forwarded from Pueblo. The engineers have prosecuted surveys as far south as Chihuahua, Mexico, and are still going forward.

#### Southern Pacific of California.

On the 12th ult. this company's surveying corps had reached Fink's Springs, 90 miles westward of Fort Yuma. This point, it is reported, they have found to be 200 feet below the level of the sea.

#### Lewistown & Auburn.

By a large majority Lewistown, Maine, has decided to subscribe for 2,245 shares in this company, while Auburn takes 745, leaving ten shares for individuals. The road is to be leased and operated by the Grand Trunk.

#### Valley Railroad.

It is reported that this company's engineers have found a practicable route for a railroad with grades of not more than 75 feet to the mile through Rockbridge County, Va. (in which are Lexington and the Natural Bridge), and that the subscription of this county will be accepted and the road constructed through it.

#### Baltimore & Ohio.

It is reported that the Baltimore & Ohio Company has secured the passage of an innocent-looking little bill by the New Jersey Legislature, which will enable it to complete a line in its interest right through the enemy's country to Jersey City, which now it can reach only by using the roads of its rival.

#### Toledo & Southwestern.

It is thought that the new law authorizing municipal subscriptions in Ohio secures the construction of this proposed road, whose corporations are to organize by the election of directors May 14. The route is to be by way of Grand Rapids and Van Wert or Delphos, Ohio, and Muncie, Ind.

#### Ohio Falls Car Company.

This company, whose shops were lately burned, is rebuilding with great rapidity. It calls for plans, specifications and proposals for roofing 21 different buildings, whose aggregate area inside the walls is more than two and a quarter acres.

#### New York & Canada.

The Whitehall Times says that the Delaware & Hudson Canal Company agrees to construct this railroad from Whitehall north up the west side of Lake Champlain on the following terms:

"To Port Henry within two years from March 26, 1872, and to the Canada line within three years from that date. The conditions were, first: That the New York & Canada Railroad Company should procure certain rights from the Grand Trunk Railroad Company of Canada; and second, that there should be subscribed to the capital stock of said company \$125,000 south of Port Henry and \$300,000 north of that point. The first of these conditions has been complied with, and all that remains to secure the road to Port Henry is that \$125,000 should be subscribed by Whitehall, Dresden and Putnam, and all necessary to secure the road through is the \$300,000 subscribed north. These subscriptions bind the Delaware & Hudson Canal Company absolutely to do this work, and bind it also to lease the new road when built and to pay a rental of 30 per cent. of the gross receipts therefor per annum."

If the subscriptions from Whitehall to Port Henry are not made, it is reported that the line is likely to be built up the east side of the lake by way of Fair Haven, West Haven, Benson and Orwell, crossing the bridge to Ticonderoga.

#### Nashua & Rochester.

It has been decided by the Supreme Court of New Hampshire that the location of this road by what is known as the "lower route" is legal, and that a majority of the stock (four-fifths of which is in favor of this route)

may determine the location. This decision, it is said, makes it certain that the road will be put under contract within a very short time. It will form a link in a direct route between Portland and New York.

#### Chesapeake & Ohio.

This company has located and is about to construct a branch in the city of Richmond, from its eastern terminus at Rocketts to the Tredegar Works, passing by large flour mills, and affording an opportunity to connect with the York River and the Richmond & Danville railroads.

#### Boston & Maine.

The contract for building the extension of this railroad from the depot grounds in Portland to Vaughan's Bridge has been awarded to J. P. Austin & Co., of Truro, Nova Scotia. There will be a great deal of rock work and a tunnel, and the cost of the improvement, including a new station, will be about a million.

#### Boston, Hartford & Erie.

The Boston Commercial Bulletin replies to a correspondent who inquires how many different sorts of Hartford & Erie securities there are afloat, as follows:

"The old first mortgage bonds amount to \$600,000. They mature in 1884, and the 7 per cent. interest is due March 1 and September 1. There are \$14,000,000 of the new first mortgage bonds (Berdells) due in 1889, with interest at 7 per cent., payable January 1 and July 1. There are also \$8,000,000 of these new first mortgage bonds, in addition to the \$14,000,000 which are guaranteed by Erie, due also in 1889, with interest at 7 per cent., payable semi-annually. And besides all these, there are \$4,000,000 first mortgage (new Berdells) which the State of Massachusetts holds as security for \$3,000,000 loan to the road. The share capital amounts to \$18,039,960, and the par value is \$100. The road to-day is in the hands of W. T. Hart, C. P. Clark and G. T. Oliphant, trustees of the mortgage bondholders. The receivers are out of office. C. Bradley, of Providence; Mr. Chapin, of Springfield, and George M. Barnard, of Boston, are assignees of the road, for the whole thing is in bankruptcy. These assignees will take all left after the settlement with the mortgage bondholders, and pay the same to floating creditors. We are not to-day able to give our correspondent the exact amount that will remain to pay floating debt."

The Springfield Republican says: "The activity in Boston, Hartford & Erie is attributable in some measure to the prospective utilization of the road by the Vermont Central group of capitalists, though of course the bankrupt stock will never become of value. The Vermont Central, not content with outlets at Boston and on the Sound, proposes not only to make a delta of the whole peninsula and cut another channel to New York, but also to have at least one cross-road from New York to Boston. Whether the undoubted wealth of its business will justify so extensive an outlay for eastern termini, the plan is now definitely stated. The New York & Boston road is now nearly completed from High Bridge, just above New York, to Carmel, a distance of 55 miles. Thence connection will be made with the Dutchess & Columbia, which extends up to Millerton, just below the southwestern corner of Massachusetts. From this point connection will be made with the Harlem Extension, thus completing the new line between New York and Rutland. From some point, it is said from Carmel, connection will be made with the Hartford & Erie, and the gaps in that road will speedily be closed up to its completion."

#### Vermont Central.

This company will very soon begin to lay a second track between White River Junction and Northfield, 54 miles. The company is also to extend the Montpelier branch from Montpelier south to Barre, about eight miles, Barre subscribing \$50,000, and lending \$50,000 more on a guarantee of 7 per cent.

#### Peterborough & Hillsborough.

Bennington, Vt., has voted 5 per cent. of its assessed valuation to aid in the construction of this road.

#### New Jersey Railroad & Transportation Company.

At a special meeting of this company on the 23d ult. the recent act of the New Jersey Legislature authorizing a consolidation of this with the Camden & Amboy and the Delaware & Raritan Canal companies was accepted by a unanimous vote. The other two companies accepted this act on the 18th. By the terms of this act each of the companies will choose four members of the first directory and the State one. The capital stock of the consolidated company will be about \$19,000,000.

#### Erie Railway.

The following is the notice of the Heath & Raphael Committee, announcing their arrangement with the Bischofshain & Goldschmidt party—the party in power. The circular is signed by H. L. Raphael, R. A. Heath and E. F. Satterthwaite:

"We consider it desirable that all interests should work together for the election in July next of such a board of directors as will best serve the interests of the Erie shareholders."

"We have, therefore, arranged with Messrs. Cryder, Green and Homann, the directors of the Erie Railroad now resident in London, a course of action which will enable us to co-operate with them in electing the best possible board."

"The bill lately passed by the Legislature provides that only those who can prove that they are bona-fide holders of stock, or persons acting as trustees, and having the share certificates deposited with them, shall vote at the elections. It is, therefore, indispensable that holders should lodge their share certificates in the hands of the parties to whom they wish to intrust their voting power."

"We therefore recommend all shareholders to deposit their share certificates at the London office of the Erie Railway, and to intrust their proxies to the London directors."

"If, however, any persons prefer to intrust their proxies to us, or to deposit with us share certificates

registered in the names of Messrs. Heath & Raphael, we shall continue to receive the same, and will, in co-operation with the London directors of the Erie Railway, exercise the voting power in respect of such shares, at the next election, in support of the best board of directors."

#### New York & Albany.

The New York Legislature has authorized the city of Albany to issue its bonds to the amount of not more than \$1,100,000, to aid this company in the construction of a railroad down the west side of the Hudson on the following conditions: That it shall receive from the New York & Albany Company its stock to the amount of the bonds, and that the Delaware & Hudson Canal Company pay the interest on the city's bonds for two years and guarantee and indemnify the city against the final payment of the principal in consideration of receiving the city's stock. This, it is reported, will secure the construction of the proposed road in the interest of the Delaware & Hudson Canal Company.

#### Peninsular of Michigan.

It is reported that the Grand Rapids & Indiana Company is likely to secure an interest in this company and make the road an outlet to Chicago. The Peninsular is to use the Fort Wayne road from Valparaiso to Chicago, and the Fort Wayne Company controls the Grand Rapids & Indiana. The latter crosses the Peninsular at Brady, about ten miles south of Kalamazoo, and the distance by it to Chicago would be a little further than by the Michigan Central, which now has the Chicago business of the Grand Rapids & Indiana from points north of Kalamazoo.

#### Iowa Eastern.

This company recorded a mortgage for \$900,000 on its franchises and other property, in Polk County, Iowa, April 25.

#### Iowa, Minnesota & North Pacific.

This company has sent out engineers to locate its line from Monroe (on the Des Moines Valley road, 32 miles southeast of Des Moines) north to Newton, on the Rock Island road, about twelve miles. Thence the line is to be due northwest and generally about 30 miles east of the Des Moines Valley road till it reaches Webster City.

Colonel J. A. McDonnell, of Keokuk, is Chief Engineer, and Hamish, Davis & Co. have the contract for construction. Jasper, Story and Hamilton counties have voted the company a swamp land grant on condition that the road be completed through them within twelve months.

#### Chariton & Oskaloosa Railroad and Mining Company.

This company, recently organized in Iowa, intends to construct a railroad from Chariton, a station on the Burlington & Missouri River Railroad 130 miles west of Burlington, northeastward, and to engage in mining coal. From Chariton to Oskaloosa the distance is about 40 miles, with a good country on each side and the railroads now built not too close to the proposed line.

#### Keokuk & St. Louis.

The North Missouri Construction Company has taken the contract for constructing the part of this road along the Mississippi between Dardene and the Ralls County line, about 65 miles. Dardene is on the St. Louis, Kansas City & Northern road nine miles west of St. Charles, Mo., and the Ralls County line is about twelve miles below Hannibal.

#### Danville, Tuscola & Western.

The contract for the construction of this railroad has been let to Leverett Brown, of Indianapolis.

#### St. Louis, Alton & Terre Haute.

The annual election of this company will be held in St. Louis on the 3d of June. The transfer books were closed May 3, and will be opened the day after the election.

#### Decatur & State Line.

This company invites proposals for the completion of the clearing, grubbing and grading of sections 99 to 128, inclusive, of this road. They are to be addressed to the Chief Engineer, Mr. S. B. Carter, at the office in Bryan Block, La Salle street, Chicago, by noon of the 7th inst.

#### Southern Minnesota.

We are informed that the office of the Master Mechanic and the shops of the Southern Minnesota Railroad have been removed from Hokah to Wells, Minn., where all the principal work will be done hereafter.

#### Wisconsin Central.

A correspondent writes: "We are pushing the work vigorously, are track-laying on the Middle Division, west of Stevens' Point. A large force is now clearing and grading on the Northern Division (from Lake Superior south), and a dock is being built at Ashland."

#### St. Louis, Kansas City & Northern.

Delegates from Southern Iowa have been trying to persuade this company to construct a railroad from Moulton, a station on its Northern Division very near the line between Missouri and Iowa, north by west to Albia, 27 miles, on the route of the Central of Iowa, and from Albia northwest to Des Moines, 68 miles, on the Albia, Knoxville & Des Moines route, nearly parallel with and not far south of the line of the Des Moines Valley road. On both sections considerable grading has been done for some time.

#### Iowa Pacific.

By a recent arrangement this company becomes practically merged in the Chicago, Dubuque & Minnesota, of which, indeed, it will be a branch, it being intended to construct it from a junction with the Turkey River Branch of the latter at Fayette westward. Mr. G. W. Michell, the late President, and Mr. Manson Brown are to take a contract for constructing a considerable portion of the road.

#### Peoria, Atlanta & Decatur.

The directors have made a financial statement, by which it appears that the company has received for the

\$100,000 of bonds issued to it by Peoria, \$72,220; for \$59,000 of Little Mackinaw bonds, \$24,615; for 74 Atlanta bonds, \$30,250—a total of \$127,085. It has paid to contractors on account of construction \$111,415.67, and the entire balance for engineering, right of way and expenses. The company will receive other bonds on completing more of the work, the whole of which is under contract.

#### Winona & St. Peter.

The extension of this railroad beyond New Ulm is progressing rapidly, and it is reported that the iron for this 108 miles, and also for the 36 miles in Dakota, has been purchased.

#### Marietta & Cincinnati.

A tunnel lined with wood work on this railroad between New England and Big Run caught fire on the 25th ult., and was pretty thoroughly burned out.

#### Shenandoah Valley.

The contractors are now at work grading on the part of the road in Clark County, Va., with a small force.

#### Cincinnati & Peoria.

A new route between these cities was opened on the 1st instant, over which a through car runs daily. It is by the Indianapolis, Cincinnati & Lafayette Railroad from Cincinnati to Lafayette, the new Cincinnati, Lafayette & Chicago from Lafayette to Sheldon, near the Illinois line, and thence to Peoria by the Toledo, Peoria & Warsaw.

#### Davenport & St. Paul.

The contractors have resumed work on the extension of this road. Most of the grading is done as far north as Fayette, and all is to be ready for the iron by the middle of June. The iron is laid within a mile and a half of Hopkinton, and it is expected that trains will be running as far as Delaware by the middle of June, and to Fayette by August.

#### Des Moines Valley.

A bill in equity has been filed in the United States District Court at Des Moines, Iowa, for a foreclosure of this company's mortgage. If not contested a foreclosure can be obtained at a session of the said court this month.

#### Dubuque Southwestern.

There is a report that this company will have close relations with the Chicago & Northwestern, and not with the Illinois Central, which forms its natural outlet.

#### Dubuque & Sioux City.

Mr. J. P. Farley, late Superintendent of the Iowa Division of the Illinois Central (which includes this company's road), is at once General Manager, Secretary and Treasurer of the Dubuque & Sioux City Company, the company, it is reported, concentrating offices in one man for the sake of economy.

#### Cairo & Fulton.

The Cairo *Bulletin* reports that the old section of this road, partly destroyed during the war, from the Mississippi opposite Cairo to Charlestown, Mo., is nearly completed, and that engineers are driving the grade stakes from Charlestown to the Arkansas line.

#### Annual Meetings.

The annual meetings of the following companies for the election of directors will take place as indicated below: New Jersey Midland, at Wortendyke, Bergen County, N. J., May 8; Central of New Jersey, at Jersey City, N. J., May 10; New York & New Haven, at New Haven, May 16; Texas Pacific, corner of Warren and West streets, New York, May 20; Atchison, Topeka & Santa Fe, at Topeka, Kan., May 30; New York Central & Hudson River, in the Exchange, Albany, June 5.

#### New York, Westchester & Boston.

The New York & Boston, the New York & Croton River, and the Pelham & Port Chester railroad companies, all operating in Westchester County, New York, have been consolidated under the above name, and the officers are now negotiating for right of way.

#### Mobile & Alabama Grand Trunk.

There is now completed 42 miles of this railroad, from Mobile northward to Leoma. The road is to connect with the Selma & New Orleans road at Hamden, 105 miles north of Mobile. It is reported that the part of the road in operation already earns enough to pay working expenses and something more. The company has recently closed a contract with I. Donovan & Co., who have recently completed a section of the road, for the construction of the 63 miles to Hamden.

#### Methods of Reducing the Cost of Railroad Construction.

The following extracts are made from a paper read before a meeting of the American Society of Civil Engineers, on the 21st of February, 1872, by Major Alfred F. Sears:

**Width of Road-bed.**—The most important change that I have to propose concerns the width of the road-beds for the common gauge of 4 7-10 feet. It is the general custom to specify a uniform width of road-bed on embankments throughout the whole length of a line of road, and another uniform width for excavation. Occasionally the width at sub-grade is the same throughout both cut and fill.

I have abandoned this system as incorrect in principle and unnecessarily expensive.

**On Banks.**—The first element to consider in determining the width of a bank after getting sufficient for the length of a sleeper, is its height. We require only earth enough outside the tie to protect our road from the effects of rain-wash. Generally we find banks of a single foot in height bearing the same width as banks with twenty feet of slope. Yet a slope one foot long is not exposed to one-twentieth part of the liability of a slope of twenty feet.

Suppose, to simplify the question, that no water is absorbed by the material, then the first foot<sup>1</sup> of slope below the road-bed is washed by just the amount of water that falls upon its surface; the second foot by what has fallen upon its own area, and what has flowed over it from the foot above; so that if

<sup>1</sup> I use "foot" as a convenient unit.

a represent the amount of liability to which the first foot is exposed, 2 a will represent the liability of the second foot, 3 a of the third, and 20 a of the twentieth foot; while the total exposure of the slope is equal to the sum of the series; a slope 20 feet long is therefore, under the hypothesis, liable to 210 times the damage that may accrue to a slope 1 foot long.

The books generally tell us that the common earths stand at a permanent slope of say  $\frac{1}{3}$  horizontal to 1 vertical, and further, that when a vertical bank first assumes a slope, it is curved—the lower portions being horizontal, while the top of the slope remains vertical; but that eventually a uniform slope is formed which becomes the permanent slope of the material. I confess that in twenty-five years of uninterrupted professional observation I have never yet found the material which takes on a uniform slope, or anything approaching it, without the aid of a spade. On the contrary, a walk over any section of an American railroad will exhibit as many illustrations as there are considerable banks of the principle that the natural slopes of all materials are curves. I suspect we have come, or rather been brought, to accept the commonly-received notions on the subject by the fallacious system of averages; a mischievous instrument for any use except in the hands of the skillful, cautious and conscientious.

Now, without entering on the useless trifling of ascertaining the curves of slopes, we may, by an observation of the actual fact, be assisted to very considerably economize work.

In banks a foot or two in height, we shall learn that a nominal slope for the purposes of the estimate is all that a permanent road-bed requires.

The embankments of what are known as surface roads are thrown up from side ditches, and are therefore amply protected from damage by water. I build such banks 10 feet wide on top, when ballast is required, and specify a slope of 1 to 1 as a definite limit to measurement. The ordinary custom in this region is to construct such banks 14 feet wide with slopes of  $\frac{1}{2}$  to 1.

It is true that if a tie is 8 feet long, this width of bank will not allow much latitude for corrosion; but the repair of such waste is always more cheaply made by a company in operation than before their line is opened for work; a proposition to be discussed hereafter.

Where my banks attain a height of more than 3 feet, I increase their width to 11 feet; the additional foot being placed on one side of the center line to facilitate the movements of the track-layers. I have found a berm of  $\frac{1}{2}$  feet sufficient for all the movements required in track-laying. At the same time I reduce somewhat the horizontal angle of the slope as the height of the bank increases; thus a bank 3 feet high is sloped 1 to 1; if higher, all between 3 and 12 slopes  $\frac{1}{2}$  to 1; and below 12, 1 to 1.

In some materials, as in clay, I should use a slope as flat as  $\frac{1}{2}$  to 1 for the light banks; but in the ordinary earths I think it needless. It receives more water than a steeper slope of the same height, and does not permit as rapid escape of the flood.

In practice, the assistant on whom devolves the duty of setting slope stakes soon acquires dexterity in his calculations. Thus, for a bank 3 feet high his top width is 10 feet. For a height exceeding 3 feet and below 12 feet he deducts 3 feet and proceeds as if the top width were 16 feet, with slopes of  $\frac{1}{2}$  to 1. Where the altitude of the bank is greater than 12 feet, he deducts 12 feet, works from a top width of  $3\frac{1}{2}$  feet, and sets his stakes for a slope of  $\frac{1}{2}$  to 1.

Some assistants cross-section the ground, and make up the slope distances in the office.

The calculation of solids will not be found difficult, though involving somewhat more labor than in the case of simple slopes.

**In Cuts.**—I pass now to consider the methods of dealing with the excavations of a railroad.

The common system is to establish a uniform width of road-bed and interior side ditches, without reference to the depth or position of the cut. Several circumstances ought to modify these features.

A cut 1 foot deep cannot demand side ditches to carry the same amount of rain-fall that a cut 2 feet deep will require. Nor is there the same danger to be apprehended from the slip of the banks. Here are two reasons, then, for reducing the width of light cuts and also for modifying the slope.

Again, if an excavation is made through a flat plain, the two side ditches may be of equal dimensions; but if on a side hill, two circumstances affect this condition. The ditch under the upper side must drain a longer slope than the other, and is also liable to demand for draining the side hill above, when a berm ditch fails or a berm bank breaks; it should, therefore, be the more capacious ditch: yet even in such cases the side ditches are usually of equal dimensions.

In a cut 3 feet deep through plain, I make no excavations below sub-grade for ditches. If there be no ballast except such as is thrown between the cross-ties, there will result side drains 6 inches deep, which are sufficient for the purpose.

But when a steep side-hill cut is to be drained—a cut with say 20 feet of slope on one side and but 2 feet on the other—I have sunk a ditch 6 inches below sub-grade with a top width of 2 feet under the long slope, and provided none whatever along the lesser slope, except as in the case of a shallow cut through a plain, namely, such as is made by the ballast.

The capacity of the side ditch is further dependent on the grade assisting to drain the cut.

I apprehend that more width is usually given to road-beds in excavations than they require. In this region it is 18 feet, with side-slopes of  $\frac{1}{2}$  to 1 or 1 to 1.

I am working considerably below this figure. Thus in gravel excavations of three feet or less I construct with a bottom width of 10 feet only and side slopes of  $\frac{1}{2}$  to 1. This will furnish a light gutter along each side of the track, and is all we require to keep it clear of water.

For a cut of more than 3 feet and less than 6 feet, I make a bottom width of 12 feet and slope of  $\frac{1}{2}$  to 1. For a cut of more than 6 feet and less than 12 feet, 18 feet bottom width, and slope  $\frac{1}{2}$  to 1.

In this arrangement I have not designed finishing the cuts on compound slopes as in the case of embankments; my reasons for this course lead to a discussion of the question previously referred to, concerning the comparative cost of building a perfect work in the first instance and leaving it to be perfected by the company with a road in full operation.

It is a pet notion with the newspapers, and perhaps also with some engineers, that permanence in the first construction is true economy. It may be fairly doubted whether such is the fact, even when companies are possessed of what is called "ample means."

The entire excavation, so far as done, could be taken out for a less sum per yard if the contractors could escape the very expensive operation of "trimming up," as usually executed by them. They are required to dress the slopes neatly; and then, to make sure of their standing, the engineer specifies a slope so flat as to insure its permanence beyond the possibility of accident. Now the ordinary earths will stand through a year, until the first spring, on a slope of  $\frac{1}{2}$  to 1. The general breaking up of things in the spring will bring down some of these slopes, creating a mass to be removed from the ditches, while many will remain standing permanently; such banks are clear gain.

At present prices, a gravel train will remove the detritus of the slopes for about 15 cents a yard; a work which could not have been done in the original instance by the medium of a contractor for less than twice that sum. It is done by the earnings of the road only, as it is demanded; instead of forming a dead capital for which the road is suffering annual damage in the shape of interest to be added to the shrinkage of its bonds.

I think engineers will eventually come to recognize that every dollar possible must be saved in the original construction of a

work. Every unit of work on a road, which can be done after it is in operation and the present neglect of which does not prevent the safe and economical movements of trains, should be so deferred. And this is simply a measure of proper economy, independent of the means of a company.

Allow me to illustrate by reference to the work I have in charge at this time. My road is 80 miles long. At 30 cents per yard, I find it will cost about \$42,000 more to take out its excavations on a slope of 1 to 1 than if they were permitted to remain at  $\frac{1}{2}$  to 1, there being 141,000 yards more to be removed. Now, the cuts being shallow, the corrosion of the slopes will not interfere with the track; the ditches will occasionally be obstructed, but proper watchfulness and the exercise of fair judgment will generally prevent this inconvenience.

The amount of \$42,000 will doubtless be increased to \$46,000 by the shrinkage in bonds, a capital the annual value of which is \$3,220. If, then, the company save the original capital, they will have this annual amount of \$3,220 to apply to removing such material as falls from the slopes; at a cost of 15 cents per yard, they may thus take care of more than 21,000 yards per year. I believe this annual labor will keep pace with the corrosion of the slopes till the "trimming up" is complete.

But the measure of economy is not yet full. In seven years, the slopes, if need be, will have been reduced to the standard of 1 to 1, at a cost of \$22,540, whereas, if taken out in the first instance, the actual outlay will be twenty years payment of \$3,220 interest, and then the principal, \$46,000, or a total sum of \$110,400. I have omitted mention of interest on the annual payments as being an element common to both cases.

Will you permit me one more illustration drawn from the same work? It concerns an important example occurring in less magnitude at several points of the line. We cross a ravine 140 feet deep for a short distance in the center, and reach grade on each side in a total distance of 700 feet. It will require 110,000 cubic yards of earth and a small arch culvert to build an embankment across the place.

Which will be the true economy, leaving out of view the present means of the company? To construct the permanent work or trestle the valley, leaving it to be filled in hereafter?

The material may be procured sufficiently near the spot to build the bank for 40 cents per yard, or a total cost of \$44,000. The culvert would probably cost \$3,000, the shrinkage on bonds would require the expenditure of a capital of \$53,000 to construct this work.

I can build a trestle of the timber of the country, 550 feet long for \$20 per foot, or \$1,100, and put in the bank approaches for \$2,000 more, or a total outlay of \$13,000, requiring an expenditure of the company's capital stock of \$14,500. The trestle is good for ten or fifteen years. The comparative annual outlay will be as follows:

First.—On temporary work :	
7 per cent. interest on the cost (\$14,500) .....	\$1,015
10 per cent. depreciation of trestle (\$11,000) .....	1,100
<b>Total.....</b>	<b>\$2,115</b>
Second.—On permanent work :	
7 per cent. interest on \$53,000 .....	\$3,710

Annual difference in favor of the trestle system will be \$1,595.

Suppose, then, we build the trestle and then apply the \$1,595 annually to filling the ravine with permanent work. It will cost us about 12 cents per yard for the material, so that we can put in about 13,000 cubic yards per annum. In ten years we shall have filled the ravine and built the culvert instead of rebuilding the trestle, and we shall have done this out of the saving in interest money. When the job is done our capital is released to us for other work.

The total outlay in this case will be, for the first

Cost of trestle and approaches.....	\$14,500
Ten years of interest and repairs.....	21,150
Total amount of annual outlays in filling ravine.....	35,950
 Or, in all, a sum of.....	 \$51,600
Whereas, if the embankment be now built, it will cost 30 years' interest (\$3,710) .....	74,200
And then the principal.....	58,000

Or a total amount of.....

I estimate that the result of this system of construction saves to us in present outlay of original capital about \$290,000, which, before it could be paid, would have drained the company in twenty years of \$696,000, or  $3\frac{1}{2}$  per cent. per annum of the capital stock, which, as the case now stands, we shall add to our income.

I have built no walls for cattle-guards for several years. A common iron or wooden grating, extending from fence to fence across the road, and six feet wide in the direction of its length, the grates being parallel thereto, is a sure protection against the invasion of cattle, and costs but little, compared with the ordinary methods. Though it has been in use by many engineers in parts of the country for twenty years, I still find men who build culvert masonry for cattle-guards.

While I should be glad, gentlemen, to believe that these suggestions may assist to reduce the cost of constructing railroads I am forced to recognize a certain class of obstacles in the way of the engineer, that he struggles against in vain, and must continue to do so long as the present extravagant system continues of letting works in the lump.

These obstacles result from the combined ignorance, conceit and corruption in boards of direction having to deal with a certain class of public securities, such as State, county and municipal bonds, whereby all the machinery of political jobbery and cunning is set to work, and the conscience of the company is debauched before operations are fairly commenced.

A common practice is to set forward as president a simple-minded, credulous man, of fair reputation for integrity, who thus possesses the confidence of the community, and whose vanity and weakness of mind make him the tool of a smart bad man, the manipulator of the executive committee. The engineer, placed thus between a knave and a fool, soon finds himself at the mercy of a single man, unscrupulous, tyrannical and successful. He learns that his board by their own action have been reduced to "one mind"—the conduct of which he is not to observe too closely or he must resign in half disgrace.

In any event the result on the cost of building his work is the same. The knave, by consent of the board, lets the work to a confidential associate, a railroad contractor, at an outrageously high figure. The engineer's plans of economy are overruled, and he is finally pushed aside for the opinions of a man, who, though ever so ignorant, being a contractor, is supposed to possess superior practical knowledge of railroad construction, and who is quietly putting the company into his pocket.

There is probably not a road in the State of New York now under construction, built in the lump, with town bonds, that is not being fraudulently depleted to the extent of from five thousand to twelve thousand dollars per mile before the superstructure is touched.

And yet, in all the revelations of fraud for which the day is conspicuous, there appears no apprehension of this condition of things.

One protection against this outrage is to be found in the old practice of letting the work by the cubic yard, which is the only safe method and presents the only fair way of receiving the bids of contractors.

But when this corruption shows itself in a board the engineer should expose and denounce it as soon as it appears, though at the risk of defeat and dismissal—a result that would not many times occur, since the public attention would be aroused and the engineer would soon come to find himself occupying his true relation to the company that employs him.